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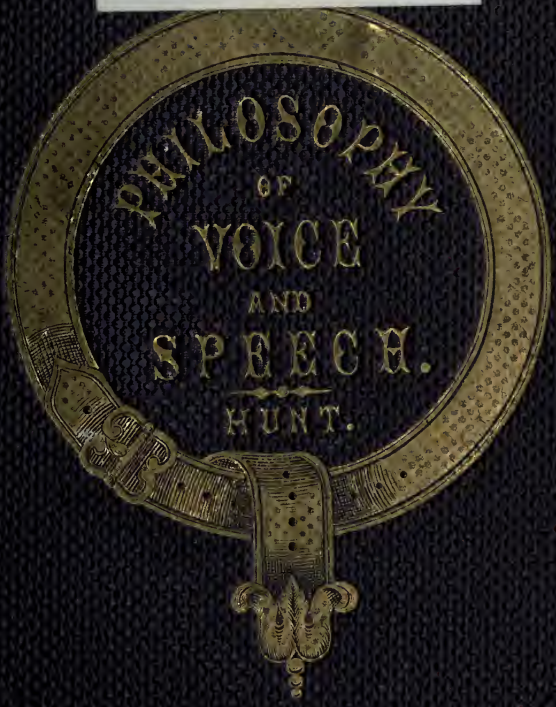

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Chapter XVII

A MANUAL

OF THE

PHILOSOPHY

OF

VOICE AND SPEECH,

ESPECIALLY IN RELATION TO

THE ENGLISH LANGUAGE

AND

THE ART OF PUBLIC SPEAKING,

BY

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MDCCCLIX.

"Eloquentia non modo eos ornat, penes quos est, sed etiam universam rempublicam."—Cic.

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TO THE

REV. CHARLES KINGSLEY, M.A., F.S.A., F.L,S.,

RECTOR OF EVERSLEY, HANTS,

&c. &c. &c.

My Dear Sir,

I know not to whom I could with greater propriety dedicate these pages than to yourself, who have at all times borne such valuable testimony to my professional labours.

It will ever be to me a source of the greatest satisfaction that I have been instrumental in enabling you more freely to give *vivâ voce* expression to those noble thoughts which breathe in all your writings.

That you may long live to instruct and delight mankind, is the sincere wish of,

My dear sir,

Your faithful Servant,

JAMES HUNT.

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PREFACE.

THE main object of this work, is to furnish the reader with a succint account of the leading opinions and essential facts bearing upon the Philosophy of Voice and Speech, as applied to the art of speaking.

No writer, native or foreign has, to the knowledge of the author, hitherto attempted to epitomize all the varied subjects introduced in this volume, and to embody the whole in a collected form. In following out his plan, it has been the author's study to treat each subject under a particular head; so that taken separately, each chapter may form a treatise—not exhaustive, but merely suggestive—while, taken collectively, they will be found correlated and collateral to the main subject.

The reader should also bear in mind that in a volume like the present, comprising such a variety

of topics, which have individually been frequently discussed by the most eminent writers, the amount of original matter cannot be very large; but professing to be merely "A Manual," it is of much less consequence that the opinions advanced should be *new*, than that they should be *true*.

All that can fairly be expected from the writer is, that he should not have shrunk from the labour of making himself acquainted with the principal facts which have accumulated in process of time, and that he should have properly arranged them for the better convenience of the reader.

In the selection of his materials, the author can conscientiously aver that he has spared no pains to collect information from the best authorities and from every available source, and has endeavoured, impartially, to give prominency to such works as give exact information.

Wherever it was requisite, the very words of the various authors are given, in other instances their opinions had to be compressed, but (it is trusted) without any disadvantage to their precise meaning.

The author has endeavoured to show that there are many things, which though little thought of, are well deserving the attention of the public; to exhibit

important results without inflicting upon the reader the necessity of wading through the laborious details by which they have been obtained; and to indicate to the more exacting student the most authentic sources from which he can derive further information.

The writer by no means flatters himself that he has altogether succeeded in his task. Errors in statements, redundancies, and omissions, will no doubt be found; indeed, they are, to some extent, unavoidable in a work of this kind; yet it is hoped that not many salient facts bearing upon the subject, have been omitted.

It may also be observed that where compression becomes a matter of necessity, minor considerations, as to elegance of style, &c., have to be sacrificed; nor can every subject be rendered equally perspicuous; and the reader must be frequently left to deduce for himself.

The importance and interest which now attach to the subject of public speaking have induced the author to assign a larger space to the chapter on Oratory than was at first intended.

With this brief statement of the main points to which his efforts have been directed, under many

interruptions, and the pressure of professional engagements, the author submits this work to the public, hoping that it will be judged rather by its scope and general merit than by the treatment of individual subjects.

In conclusion, the author has to express his acknowledgments to several friends, and especially to the Rev. Charles Kingsley, and Mr. Thomas Wright, for much valuable information and kind suggestions.

Ore House, near Hastings.
December, 1858.

CONTENTS.

CHAPTER I.

Respiration 17

CHAPTER II.

The Nervous System 33

CHAPTER III.

Sound , ... 55

CHAPTER IV,

The Organ of Hearing 65

CHAPTER V.

The Vocal Apparatus 71

CHAPTER VI.

The Organs of Articulation 81

CHAPTER VII.

Production of the Voice 92

CHAPTER VIII.

On Language in General 125

CHAPTER IX.

Ventriloquism and Speaking Machines . . 133

CHAPTER X.

General Survey of the Elements of Speech 148

CHAPTER XI.

On the Origin of Language 163

CHAPTER XII.

Primitive and Cognate Languages . . 174

CHAPTER XIII.

Origin and Development of the English Language 203

CHAPTER XIV.

Origin and Progress of Writing . . . 227

CHAPTER XV.

Analysis of the English Alphabet . . . 254

CHAPTER XVI.

English Orthography and Orthoëpy . . 278

CHAPTER XVII.

Pasilogy and Pasigraphy 288

CHAPTER XVIII.

Disorders of the Voice, and Defective Articulation 298

CHAPTER XIX.

Deaf-Dumbness and Muteism 317

CHAPTER XX.

Cultivatiôn and Management of the Voice . 349

CHAPTER XXI.

Oratory and Public Speaking 369

INDEX.

A

	PAGE
A, sound of (*See, also,* Vowel System)	254
Action in Speaking	383
Addresses, Public	372
Æschines	397
Afferent Nerves	33
Affinity of Languages	199
African Languages	188
Agglutination	187
Air, Volume of, respired	24
Air-cells of Lungs	23
Albertus Magnus	140
Alfred, King	210
Alfric, Bishop	211
Alliteration	167
Alphabet, Origin of the	228
,, Hebrew	244
,, Greek	245
,, Phœnician	245
,, Roman, introduction of the	248
,, Runic	247
,, Russian	244
,, Analysis of the English	254
Alto	107
American Languages	191
,, Picture-writing	231
Androids	140
Angles. Arrival of the	208
Anglo-Saxon Language	209
,, Breaking up of the	211
Aphonia	299
Arabic Languages	195
Arbor Vitæ	35
Arian Races and Languages	196
Armitage, Case of Miss	347
Articulate Sounds	149
Articulation, Organs of	81
,, Training of the Organs of	364
Articulations, First	165
Arytenoid Cartilages (*See* Larynx)	
Assyrian Writing	237
Audience, Influence on the Speaker	380
Auditory Nerves, (*See* Cranial Nerves)	
Augustine, St., Arrival of	209
Auricle (*See* Ear)	
Automata	140

B

B, sound of	255
Barytone	107
Basque Language	188
Bees, Sounds of	123
Boustrophedon Writing	243
Brain, Structure of the	35
Breaking-down in Speaking	379
Breath, Management of the	367
Bridgman, Laura, Case of	328
British Orators	399
Broken Vowels	153

	PAGE
Bronchi	26
Burke, Edmund	402
Burr, Newcastle	310

C

C, Sound of	256
Cadmus	245
Caedmon	209
Cartouche	236
Caxton	253
Celts	204
Cerebellum	35
Cerebro-Spinal system	34
Cerebrum	35
Chatham, Earl of	400
Chaucer	214
Chinese Language	182
,, Writing	241
Chronicle, Saxon	209
Chrysostom, St.	412
Cicadae, Sounds of	124
Cicero	398
Click, Hottentot	160
Cochlea (*See* Ear)	
Codex Argenteus	207
,, Mendoza	233
Concha (*See* Ear)	
Consonants	156
Cord, Spinal	39
Cords, Vocal (*See* Glottis)	
Coster	251
Coughing	30
Cranial Nerves	46
Crico-arytenoidei	77
,, thyroidei	77
Cronke, Dickory	331
Cry, Notation of the human	127
Cuneiform, or arrow-headed writing	237
Cutting, Margaret case of	89

D

D, Sound of	257
Deaf and Blind, Cases of	327
Deaf-Dumbness	317
Deaf-Mutcism, Causes of	338
,, Statistics of	336
Deaf-Mutes, Physical Condition of	324
,, Intellectual Capacity of	325
,, Education of	340
Deafness, Causes of	69
Delivery	387
Demosthenes	397
Diaphragm, Structure of the	19
,, Function (*See also* Breath)	20
Dieffenbach, Prof., on Operations	312
Digraphs	275
Diphthongs	154
Discourse, Composition of a	375
Disorders of the Voice	298
Disraeli, B.	380
Dog, Speaking	131
Dysphonia	304
Dysphonia Clericorum Causes of	304

E

E, Sound of (*See also* Vowel System)	258
,, Mute	154
Ear, External	65
,, Middle	65
,, Internal	66
,, Musical	100
,, Education of the	354
Earnestness in Delivery	389
Echo	58
Edward the Confessor	211
Elements of Speech	148
Elizabeth, Queen	281
Elocution	387
Eloquence, eventual decline of	408
Encephalon, functions of the	36
Enchorial Writing	234

PAGE

English Language, Origin and Development of the 203
,, Present state of 217
,, Excellences of 223
,, Orthography and Orthoëpy . 278
Epée, Abbé del' . 343
Erskine . . . 406
Eustachian tube . 68
Exordium . . . 376
Expelling System . 363
Explosive System . 363
Explosives (*See* Consonants)
Extempore Speaking . 374

F

F, Sound of . . . 295
Facial Nerves . . 48
False Notes . . 357
Falsetto . . . 102
Fenestra ovalis / ,, rotunda } (*See* Ear)
Fox, C. J. . . . 401
Frontal sinus . . 110
Fust, J. . . . 252

G

G, Sound of . . . 259
Gamut . . . 62
Ganglionic System . 34
Gees Language . 195
Gerner's, Dr., treatment 303
Gilles, St. . . 135
Gland, pineal . . 39
,, pituitary . 39
,, thyroid . . 74
Glottis . . . 76
Goths 205
Gothic Language . 207
Grammatical Systems 179
Grimm's Law . . 200
Gutenberg, J. . . 252

PAGE

H.

H, Sound of . . . 260
Hearing, Organ of . 65
Hengist . . . 208
Hiccup . . . 30
Hieroglyphics . . 234
Hohenlohe, Cures of Prince . . . 333
Horsa . . . 208
Hortensius . . . 398

I

I, (Sound of (*See also* Vowel System) . 262
Impediments of Speech 309
Indo-European Languages . . 196, 199
Ingulph . . . 212
Insects, Sounds of . 123
Inspiratory Voice . 112
Instruments, Musical . 61
Invention of Printing 250
Iranian Languages . 196

J.

J, Sound of . . 263
Job 229
Jutes, Arrival of . 207

K

K, Sound of . . . 263

L

L, Sound of . . . 264
Lablache . . . 111
Labyrinth . . . 66
Lallomany . . 320
Language in General . 125
,, Natural 125
,, of Animals 126
,, Artificial . 128
,, Origin of 163
,, Organ of . 319

PAGE

Languages, Primitive and Cognate . . . 174
,, Number of 179
,, Classification of 181
,, Chinese and Indo-Chinese 182
,, Siamese . 184
,, Turanian . 187
,, African . 188
,, Malayo-Polynesian . 190
,, American . 191
,, Semitic . 195
,, Arian . 196
,, Affinity of . 199
Larynx . . 71, 75
Laughing . . 31, 363
Learning by Heart . 378
Leblanc, Case of . 335
Leibnitz . . . 290
Ligaments, Vocal (*See* Glottis)
Lingua Franca . . 181
Lips 90
Liquids, or Semi-Vowels 159
Lord's Prayer, the . 215
Lungs, Structure of . 21
,, Capacity of . 24

M

M, Sound of . . . 264
Malibran, Madame, Case of . . . 303
Mankind, Types of . 176
Massieu, Case of . 325
Meatus auditorius . 65
Medulla oblongata . 36
Mexican Writing . . 233
Meystre, Case of . 329
Mezzo-Soprano . 107
Mitchell, J., Case of . 327
Mocking Bird . . 128
Mouth 90
Mozer, Case of . 326
Mucous Membrane . 300
Mutation of the Voice 111

PAGE

N

N, Sound of . . 265
Nerves, Stucture and Distribution . 33
,, Cranial . 46
,, Spinal . . 41
Nerve-force, velocity of transmission . . 45
Norfolk, Duchess of . 281
Norman-French . . 213
Nose, Structure of . 84

O

O, Sound of (*See also* Vowel-System) . . 265
Onomatopœia . . 166
Oratory . . . 369
Orator, Moral Qualifications of . . . 370
Orators, Greek and Roman 397
,, British . . 399
Orotund Voice . 362
Orthoëpy, English . 278
Orthography, English 278
,, French . 280

P

P, Sound of . . . 266
Palate, Hard . . 83
,, Soft . . . 83
,, Cleft . . 85
Palato-glossi . . 86
Parrot of Atures . 130
Parrots, Talking . . 129
Pasilogy . . . 288
Pereira, R. . . . 343
Peroration . . 377
Perspicuity . . . 395
Pharynx . . . 81
Philosophical Language 289
Phonasci . . . 351
Phrenic Nerve . . 54
Pitt, William . . 400
Pneumogastric Nerve . 50

PAGE

Pomum Adami . . 71
Pons Varolii . 35, 38
Ponce, Peter . . 341
Porpora quoted . . 355
Pracrit . . . 197
Primitive Inhabitants of Great Britain . . 204
Proportion of foreign elements in the English Language . . . 220
Psammetichus . . 175
Psellismus . . . 309

Q

Q, Sound of . . 267

R

R, Sound of . . . 268
Raucity of the Voice 305
Rebus 236
Recoveries, Spontaneous 330
,, Alleged miraculous . 332
Reed instruments . 63
Reflex function . . 43
Register of the Voice 102
Report to the British Association . . 200
Resonance . . 110
Respiration, Organs of . 21
,, Mechanism of 28
,, Effects . . 28
,, Subordinate effects 29
Rhinophonia . . 310
Richmond, Case of . 353
Rosetta Stone . . 235

S

S, Sound of . . . 269
Sanscrit . . . 197
Scale, entire, of the Human Voice . . 105
Schœffer, P. . . 252

PAGE

Semitic Languages . 195
Semi-vowels . . 159
Sheridan, R. B. . . 403
Sibilants . . . 160
Sighing . . . 29
Singer, physical qualifications of the . . 352
Singing . . 98, 352
Sleeping in Church 418
Sneezing . . . 30
Snoring . . . 30
Sound, Nature of . 55
,, Propagation . 56
,, Velocity . 57
,, Reflection . 58
,, Intensity during night . . 60
Sounds, Distinction between . . 59
,, of Fishes . 121
,, Insects . 123
Speaking Machines . 138
,, Art of . 418
,, Public . . 369
Speech, Elements of 148
Speech-Voice . . 360
Spurgeon, Rev. C. . 415
Stammering . . . 309
Stuttering . . 310
Style 393
Swift, Dean . 412, 417

T

T, Sound of . . . 269
Teeth 91
Tenor 107
Tentorium . . 35
Timbre of the Voice . 114
,, Nasal . . 116
Times, The . . 419
Tongue . . . 85
,, Muscles of . 87
,, Morbid Affections 87
,, Loss of . . 88
Tonsils . . . 84
Tosi 357

PAGE

Trachea . . 93, 109
Trigraphs & Triphthongs 277

U

U, Sound of (*See, also,* Vowel System) . . 270

V

V, Sound of . . 271
Ventricles of the Brain 38
„ of the Larynx 109
Ventriloquism . . 133
Vestibule of the Ear 66
Vocal Cords, mean length 106
Vocal Gymnastics . 350
Vocales . . . 351
Vociferarii . . . 351
Vociferation, Value of 351
Voice, Production of the 92
„ Gravity . . 92
„ Acuteness . 92
„ Theories of the . 94
„ Extent of . 104
„ Entire Scale of the human . . 105
„ Influence of auxiliary organs . 109
„ Inspiratory . 112
„ of Animals . 119
„ of Birds . 120
„ of Reptiles . 121
„ Double . . 353
„ Cultivation of . 349
„ Preservation of 358
Vowels, Production of . 149
„ Number and Sounds of . 150

PAGE

Vowel-System . . 151
Vowels, Primary . . 152
„ Compound . 153

W

W, Sound of . . 271
Whispering . . 157
Whistling . . . 113
Whitefield, G. . . 414
William the Conqueror 210
Wind Instruments . 62
Writing, Origin of . 227
„ American . 231
„ Mexican . 233
„ Egyptian . 234
„ Babylonian 237
„ Chinese . . 241
„ Modes of . 242
„ in England . 249

X

X, Sound of . . 273

Y

Y, Sound of . . . 273
Yawning . . . 29

Z

Z, Sound of . . . 274

CHAPTER I.

RESPIRATION.

The CHEST or THORAX, which contains and protects the important organs of circulation and respiration, is formed of a portion of the backbone or spine, the ribs, and the breast bone.

The spinal column consists of twenty-four irregularly shaped bones, which form a tube to lodge and protect the most important part of the nervous system, the spinal marrow, or cord. These bones from having a slight rotatory motion upon each other are called vertebræ, (*verto*, I turn); and are connected with each other, by gristly elastic substances, termed the intervertebral cartilages. Of the twenty-four vertebræ composing the spinal column, seven belong to the neck, *cervix*, and are termed cervical vertebræ; twelve belong to the back, *dorsum*, and have received the name of dorsal vertebræ; the remaining five are called lumbar vertebræ, from *lumbus*, the loin. The dorsal vertebræ have each four articulating, two transverse

processes, and a spinal one. The two transverse processes stand out on each side, and serve for the attachment of the ribs.

The ribs, *costæ*, are generally twenty-four in number, twelve on each side. Cases, however, occasionally occur in which this number is either diminished or increased, by one or two ribs. The belief that man has one rib less than a woman, is, of course, a vulgar error. The ribs are articulated behind with the dorsal vertebræ, and in front with the breastbone, or *sternum*.

The superior seven ribs, which by cartilages are immediately connected with the sternum are called true or sternal ribs; the lower five, false ribs. With exception of the last two ribs, which are floating, they are supported by the breastbone, as they are connected with each other by cartilaginous appendages.

The breastbone, sternum, consists in early life of various pieces, two of which can be distinctly seen in the adult. The lower extremity has an appendage, which from its resemblance to a sword, is termed the ensiform cartilage, which generally does not ossify until an advanced period of life.

The breastbone has on each side seven depressions, for admitting the cartilaginous extremities of the true ribs, which are not articulated with the spine at right angles, but take a slanting direction downwards, upon which modification, costal respiration mainly depends.

Respiratory Muscles.—Most of the muscles connected with the trunk are indirectly concerned in assisting the respiratory functions; but the direct muscles which regulate the respiratory movements are

the intercostals, the elevators of the ribs, *levatores costarum*, the triangular muscle of the breastbone, and the posterior serrated muscles. These muscles are engaged in elevating the ribs to enlarge the capacity of the chest.

The principal agent, however, in ordinary respiration is the midriff, or the diaphragm, so termed because it forms a partition between the contents of the chest and those of the abdomen, and thus forms the floor of the thorax, and the roof of the abdominal cavity; being concave towards the latter, and convex towards the former. The diaphragm, though generally mentioned as a single muscle, consists of two muscles and a central tendon. It is important to observe that the diaphragm takes a slanting direction from the breastbone to the loins. When in a state of relaxation, the lateral borders, which are movable, present convex arches, which sometimes reach up to the fourth rib, whilst when in a state of contraction the arches present nearly plain surfaces, by which the capacity of the chest is increased to the same extent as it was diminished by the relaxed diaphragm.

It may be observed that, although the diaphragm is the antagonist of the abdominal muscles, it acts in union with them in the performance of other functions, as in excretion, vomiting, &c.

In a recently published work on the physiology of the vocal organs, the author maintains that the importance of the diaphragm, as an inspiratory muscle, has been greatly overrated. The following passages, in

relation to the diaphragm, are extracted from Dr. Merkel's comprehensive work.*

The chief error of physiologists of all ages, excepting perhaps Vesalius, consisted in assuming at the outset that the diaphragm contracts during inspiration, and relaxes in expiration. * * * The flattening of the diaphragm, such as physiologists imagine, and Haller describes as having seen, is scarcely possible in uninjured animals or man. * * It is besides not true that during every inspiration the abdomen dilates, which dilatation was considered as a consequence of the contraction of the diaphragm. It is just in very deep respirations that the abdomen, with exception of the hypochondrial region, contracts, which certainly could not happen if the diaphragm were flattened.† Again, if the diaphragm were such an essential organ of inspiration, it would not be found wanting in the amphibia, and especially in birds, the respiration of which is more perfect than in man. * * * According to the present theory, it is not easy to comprehend why the phrenic nerves should have an origin so different from that of the remaining nerves of inspiration. * * * Nothing, then, remains but to assume that, during quiet involuntary respiration, the diaphragm is almost inactive, and contributes nothing to the dilatation of the thorax. The central part of the diaphragm descends somewhat during inspiration, not by the shortening of its own muscular fibres, but in consequence of the contraction of muscles which dilate the thorax, and partly by the inspred air imparting a motion to the base of the lungs, * * * But whilst we deny to the diaphragm the

* Anatomie und Physiologie des Menschlichen Stimm—und Sprachorgans, vor Dr. Carl Ludwig Merkel. Leipzig, 1857.

† The contraction of the abdomen in deep inspirations has already been observed by Dr. Hutchinson, who doubted whether, in such cases, the diaphragm descended at all.

capacity of essentially contributing to the dilatation of the thorax, we must vindicate its certainly not less important function of opposing, by a suitable contraction, the upward pressure of the abdominal contents, and thus facilitating the entrance of atmospheric air into the thoracic cavity. Expiration, when involuntary, being a purely physical act, the diaphragm possesses no peculiar expiratory power. I consider, therefore, the diaphragm, not as a direct, but merely as an auxiliary inspiratory muscle in *involuntary* respiration. * * * The diaphragm becomes, however, *active* in voluntary inspiration, and when, in consequence of disease the other respiratory muscles cannot easily act.

The Organs of Respiration.

The Lungs are two conical bodies of a spongy texture, situated within the lateral cavities of the chest, and separated from each other by two layers of the pleura, which form a membraneous partition, called the *mediastinum;* so that the lungs have no direct communication with each other. The heart is situated between them. In front they are covered by the ribs, behind by the spine, and their bases rest upon the diaphragm. They are distinguished into parts called lobes, the lobes again are composed of lobules, each lobule being a small lung, and is made up of air tubes, and their terminating cells, blood vessels, lymphatics, veins, and interstitial cellular tissue. The right lung is somewhat larger than the left, the former having three lobes, whilst the left lung has only two lobes, the middle lobe being wanting; and presents in its anterior border a deep notch, into which

the apex of the heart, inclosed in the pericardium, is received.

The weight of both lungs varies, from thirty to forty-eight ounces. The lungs are not only absolutely heavier in the male than in the female, but also in proportion to the weight of the body. According to Dr. Reid and Hutchenson, the average weight is:—

	Male.	Female.
Right lung .	24 oz.	17 oz.
Left do. .	21 „	15 „
	45 „	32 „
Proportionate weight of the lungs to the body .	Male. 1 to 37	Female. 1 to 43

The substance of the lungs being of a light, porous, spongy structure, is, when healthy, buoyant in water. The lungs are, therefore, the lightest viscera in the body, both from their structure, and partly because they can never be entirely cleared from the air they contain. Before respiration has taken place, and in cases of congestion or consolidation from disease, the entire lungs, or portions of them, will sink when placed in water.

Colour.—In infancy the lungs are of a pale red; as life advances they become darker, and are variegated with spots and patches, and not unfrequently the surface becomes uniformly black. The dark colouring matter is frequently found in the lungs of persons following the occupation of colliers, and seems to be a mixture of carbon and some animal matter. From this circumstance it has been contended that, it

is always introduced from without, by the inhalation of minute particles of carbon floating in the air; this is, however, not quite certain. Many believe, on the contrary, that it is connected with the chemical changes produced during the respiratory process, and that it consists of carbon eliminated from the blood, not as carbonic acid, but in the form of a solid deposit within the pulmonary tissue.*

The air-cells in the adult vary from $\frac{1}{70}$ to $\frac{1}{200}$ of an inch, in diameter, and their number can scarcely be calculated.† Upon these air-cells the venous blood is distributed by an infinity of minute branches, derived from the pulmonary artery, and it is during its circulation upon these air-cells that its properties are altered. The great problem, which nature has solved in the structure of the lungs, was to expose the largest quantity of blood to the contact of the air, within the moderate space to be occupied by the lungs. This is accomplished in so admirable a manner, that each of the little vessels which terminate the pulmonary artery, and commence the pulmonary veins is on all sides surrounded by air, and only separated from it by the thin wall of the vessels which contain it. This membrane whilst sufficiently thick to retain the blood, opposes no obstacles to the passage of the gases.

* Quain and Sharpey's Anatomy.
† By Keil they were calculated to be about 180,000,000.

Capacity of the Lungs.

The dimensions of the lungs are so variable that no reliance can be placed upon the measurements generally given, one individual requiring more air than another, and the same person consuming, under different circumstances, various quantities. According to Goodwyn, 109 cubic inches of air are still retained in the lungs after a forced expiration. Dr. Hutchinson,* from extensive experiments, has come to the conclusion that male adults, of a mean height, can, after a complete inspiration, expel from the chest, by a forced expiraton, 225 cubic inches of air, at a temperature of sixty degrees. This quantity added to 109 cubic inches retained in the lungs, will amount to 335 cubic inches, as the total capacity of the organs of respiration for air in the adult male.

Dr. Hutchinson has, moreover, from experiments upon 1920 males who were made to breathe into an instrument, which is called the spirometer, found that the capacity of the lungs bears a uniform relation to the height of the individual, and that it increases eight cubic inches for every inch above five feet. From 15 to 35, the vital capacity increases with the development of the body, and diminishes from 35 to 65, at the rate of about one cubic inch per annum. The difference of vital capacity does not depend so much on the size of the chest, as on the healthy state of the lungs, and

* Medico-Chirg. Transactions, vol. xxix, 1846.

the extent of its movements. As the quantity of air, which an individual should breathe when in a healthy state, may thus be calculated from his height, this method may, according to Dr. Hutchinson, be applied in ascertaining pulmonary diseases. Lastly, he has found that a sitting or lying down posture causes a diminution of pulmonary capacity; in the former case from 260 to 255, and in the latter to 230 cubic inches. The presence of a full meal in the stomach will lower the capacity of the respiratory organs from ten to twenty cubic inches.

The windpipe, *trachea*, the common air passage of both the lungs, is nearly a cylindrical tube, partly situated in the neck, and partly in the chest, measuring from about four to four and a-half inches in length. It is composed of from sixteen to twenty cartilaginous rings, connected with each other by a ligamentous substance, mixed with muscular fibres. These cartilaginous rings are, however, not complete, but terminate behind in a ligamentous and muscular membrane, which, whilst completing the tube, admits of compression. The *trachea* is invested by loose cellular tissue, and moves freely on the surrounding parts. The gullet (*œsophagus*) intervenes between it and the vertebral column. It is covered with a soft membrane, secreting a mucus fluid, defending the surface from the acrimony of the air, and is provided with very numerous mucous glands, situated at the back part of the tube, serving to lubricate the internal surface of the mucous membrane, upon which their excretory ducts open.

The *bronchi* (βρογχος the throat). After descending the neck and entering the chest, the *trachea* divides into two parts, one for each lung. They differ from each other in size and direction. The right *bronchus* is shorter, but wider than the left, the former being about one inch in length, the latter nearly two inches in length. The number of rings in the right *bronchus* varies from six to eight, in the left from nine to twelve. Their general structure is similar to that of the *trachea*. Before entering into the substance of the lungs, the *bronchus* divides again into branches, one being intended for each lobe. The subsequent ramifications of the *bronchi* through the lungs, have been distinguished by the name of *bronchia*.

As these tubes proceed they become smaller, their cartilaginous rings become less distinct, until at length they disappear, so that the air-cells in which they terminate appear to be but an extension of the mucus membrane, which lines the *bronchi*. The use of the cartilaginous structure of the *trachea* and *bronchi* is evidently intended to keep the air-passages open and if we do not find them in the finest branches the probable cause is that these can never be completely, after the first inspiration, emptied of air.

Mechanism of Respiration.

Respiration consists of successive acts, by which air is received into, and forced out of the lungs. The first process is called inspiration, the second, expira-

tion. The two processes depend upon each other. That moveable frame, the thorax, is, by the action of its muscles, capable of being enlarged in all its diameters, transversely, by the elevation of the ribs, and vertically, chiefly by the descent of the diaphragm. Shortly after expiration, the muscles of inspiration begin to act. The *levatores costarum*, and the intercostals, (also, especially in females, the scaleni muscles), contract and elevate the ribs. The diaphragm descends as the ribs rise, the abdominal viscera are pushed down, and thus the throacic cavity is enlarged on all sides; the lungs expand in proportion, and a vacuum of some extent is formed within their air-cells. The consequence is that the denser external air possessing greater gravity than the internal air, which is rarefied, rushes through the nostrils into the *trachea* to occupy the formed vacuum when the act of inspiration ends. The intercostals and the other muscles now relax, and the ribs are restored to their former position, partly by their elasticity, and partly by the pressure of the atmosphere upon their external surface. The abdominal muscles also *re-act*, and the relaxed diaphragm is thrust into the cavity of the chest. The distended lungs simultaneously contract, partly by their elasticity, and as some anatomists maintain by their muscularity, the newly admitted air is forcibly expelled, and the thoracic cavity reduced to its former condition, and thus terminates the act of expiration.

Both inspiration and expiration present different degrees. Quiet respiration is chiefly performed by

the alternate contraction and relaxation of the diaphragm, the motion of the ribs being scarcely perceptible. On taking a fuller inspiration the diaphragm and muscles, which elevate the ribs, act more vigourously, and numerous other muscles co-operate with them. In a forced inspiration, when twice the usual quantity of air can be taken into the lungs, all the muscles in any way connected with the chest are called into activity; the diaphragm is contracted to its utmost extent, whilst the abdominal muscles are greatly relaxed. The contraction of the thorax, or expiration presents three similar degrees: — first, ordinary expiration; second, strong expiration; and third, forced expiration. In ordinary expiration the relaxation of the diaphragm produces a diminution of the vertical diameter. Strong expiration is produced both by the relaxation of the inspiring muscles, and a simultaneous contraction of those of expiration. In a forced expiration the abdominal and other expiratory muscles contract powerfully. The diaphragm is repressed to the utmost, the ribs descend to the lowest point, and the capacity of the thorax greatly diminished. The great object of respiration is, no doubt, the purification of the blood, which in its passage through the body becomes charged with noxious elements fatal to life. By the blood being constantly brought into contact with the air, a chemical change is effected; the poisonous constituents of venous blood are removed, which acquiring new elements from the air is transformed into arterial blood. A secondary effect of respiration, scarcely less essential to our well-being is

the evolution of caloric or heat, which, to a considerable extent, if not altogether, is the result of the chemical combination of the carbon of the blood with the oxygen of the air.

Subordinate Effects of Respiration.

SIGHING is a long and deep inspiration, followed by a somewhat quick expiration. Depressing emotions, such as care, grief, unrequited love, will cause it, as the brain influences the action of the heart. When its functions are imperfectly performed, the nervous blood accumulates in the right side, "the heart feels heavy." By expanding the cavity of the chest, the capacity of the lungs is increased, and the admission of the accumulated blood facilitated. When the chest is compressed by the inventions of the milliners, sighing can bring no relief. A groan is a sigh accompanied by an audible sound.

YAWNING is nearly allied to sighing; it consists of a full, slow inspiration through the mouth, the jaws being drawn asunder, so that the air rushes into the open fauces and Eustachean tubes, causing sometimes a crackling noise in the ears. A diminished pressure of the atmosphere, fatigue, or hunger, will cause it. We yawn or gape, either before or after sleep, when the extensor muscles have been long at rest. By accelerating and equalising the circulation of the fluids, it has an invigorating effect. To the pleasure it affords, and partly to involuntary imitation, must be attributed the propensity it excites in others equally to yawn.

Snoring is a deep sonorous respiration, chiefly produced by the vibration of the *velum palati*. In snoring, the respiration is generally through the mouth; it may, however, be nasal, and the sound will vary accordingly. On placing a portion of the tongue in contact with the *velum*, the sound may be imitated whilst awake.

Coughing arises from a great variety of causes. Any irritation of the respiratory apparatus, or of distant parts influencing the respiratory organs, will induce it. In many cases coughing, which consists of successive quick and sonorous inspirations, followed by a deep expiration, is attended by expectoration, and frequently it exists without it, hence the name of moist and dry cough.

Hiccup is a spasmodic affection of the diaphragm and of the cardiac orifice of the stomach. It consists of a sonorous convulsive inspiration, during which the *glottis* partially closes. Babies, fed too rapidly, frequently hiccup; the same causes produce it in the adult. Immoderate laughter, excessive crying, are often followed or accompanied by hiccup. It has been known to continue, with scarcely any intermission, for weeks together. Popular means to arrest a fit of hiccup consist in suddenly frightening or arresting the attention of the patient. A pinch of snuff, a draught of cold water, holding the breath, will frequently prove successful. In severer cases, anti-spasmodics applied to the epigastric region have brought the desired relief.

Sneezing results chiefly from an irritation of the mucous membrane of the nose, and belongs to reflex

action. It consists in a deep inspiration, followed by a violent expiration, during which the whole body is shaken. As there exists a direct communication between the nostrils and the eyes, sneezing frequently results from passing out of the shade into the glare of the sun. Sneezing may also have for its causes irritations of the diaphragm, the stomach, or lungs. The custom still prevailing in most parts of the continent to bless the sneezer, dates from remote antiquity. According to some it denoted a crisis in a dangerous epidemic.

When the stimulus is not removed by one sneeze, several follow in succession. If the stimulus be not too powerful, we have some control over the act, in not supporting it by the preliminary deep inspiration.

Laughing.—The smile, a lesser degree of laughing, is not properly connected with the respiratory movements, consisting merely in the contraction of the muscles of the face. The smile proceeding from mental causes is more under control, and in society frequently assumed, to give expression to complacency and pleasure. Laughter, on the other hand, is frequently beyond control, and is the expression of boisterous mirth. In laughter there is a succession of short and imperfect expirations after a full inspiration, during which the *glottis* is contracted, and a sound produced, resembling *ha! ha!* and *ho! ho!* in men, and *he!* and *hi!* in women. The giggling of girls is mostly in *he! he!* Laughing in *ho!* is not agreeable to listen to, still less in *hu! hu!* which in most cases indicates mental disease. Both the dia-

phragm and the abdominal muscles are actively engaged in violent laughter. Partly from the physical effects thus produced, and partly from nervous influence, the mind being agreeably occupied, laughter promotes digestion.

The causes of laughter are both physical and mental. To the former belong the convulsive laugh of hysterical affections, and that produced by titillation; both may, probably, be the result of reflex action. When proceeding from mental causes it may be called a "titillation of the intellect" in having presented to it a combination of incongruous images. The laughter caused on witnessing the comic humour in a pantomime, or from the reeling gait of a drunkard, may, as Hobbes believed, proceed from vanity. We feel the other *lowered*. We rarely laugh on seeing our nearest relations in a degraded state. Loud and immoderate laughter is generally considered, especially in females, as a sign of an untutored mind deficient in self-control. As, during the paroxysm, the circulation through the lungs is impeded and accumulated in the head, fits of uncontrollable laughter may cause the breakage of bloodvessels in the head and lungs, and result in death.

CHAPTER II.

THE NERVOUS SYSTEM.

The nervous system is that part of our organism which connects body and mind, and by the agency of which they influence each other.

In some parts of the body the nervous substance is collected in masses, forming what are termed centres. Two kinds of nervous matter usually enter into the composition of the centres; one kind is reddish-grey in colour, and globular in structure; the other is white and fibrous. In most other parts the nervous matter is found disposed in threads, called nerves. The nerves are composed of filaments, varying in diameter from $\frac{1}{1500}$ to $\frac{1}{4000}$ of an inch; and their size will depend on the number of filaments inclosed in a sheath.

The centres, in regard to their function, are considered as the sources of the nervous fluid—more correctly termed the nerve-force, or nervous agent. The nerves, which connect the centres with various organs and the extremities, are called centripetal, or afferent,

when they conduct the impressions towards the centres; and centrifugal or efferent, when they carry the stimuli to distant parts. The stimuli causing the nerves to act may either be physical, such as chemical substances, light, heat, electricity, &c.; or mental, resulting from thought, and the exercise of the will.

The nervous system of man is divided into two portions, which differ in structure, function, and in the extent of influence—viz., the cerebro-spinal, and the ganglionic, or sympathetic system.

The *cerebro-spinal* system consists of the brain and spinal cord, termed the nervous centres, and all the nerves directly connected with these parts.

The *ganglionic system*, is so termed from containing a number of ganglia (knots), which were once considered peculiar to it.

These ganglia, which are connected by nervous cords, extend from the head to the pelvis, along each side of the vertebral column. They receive numerous filaments, from all the spinal, and most of the cerebral nerves, and send off a number of branches, which enter into ganglia, and supply the viscera in the cavities of the chest and abdomen. Both from its distribution, and mode of action, this system is much less concerned in mental operations than the cerebro-spinal system; it has therefore, by Bichat, been called the system of organic life, as it is chiefly subservient to the performance of the organic functions; whilst the cerebro-spinal system was termed by him, the system of animal life.

The *encephalon* (the contents of the cranium),

comprehends the brain proper (cerebrum), the lesser brain (cerebellum), the tuber annulare, and the medulla oblongata. The average weight of the whole is about $3\frac{1}{2}$lb, or nearly $\frac{1}{35}$ part of the whole body.

The brain is invested by three coverings. The external, called the dura mater, is a thick and tough membrane which lines the cranium, and sends processes which sustain and separate the different parts. The second membrane is serous, and from its delicate structure is called the arachnoid, resembling the web of a spider. The pia mater is highly vascular, and invests the brain closely. The external reddish-grey substance of the brain is called the cineritious or cortical; the internal, which is white, the medullary portion.

The cerebellum, situated behind and under the cerebrum, from which it is separated, and protected from pressure by the tentorium, presents an analogous structure to the position of the medullary and cineritious matter; but, instead of convolutions, the surface presents a series of plates, separated by fissures, which admit the pia mater. It is distinguished into two symmetrical parts called lobes. The weight of the cerebellum is only one-seventh or one-eighth of that of the cerebrum.*

The *tuber annulare* (annular swelling), or *pons Varolii* (bridge of Varolius), being to the rest of the central mass only $\frac{1}{72}$, is the smallest of these centres. It is

* A vertical section being made of one of the lobes, a peculiar appearance resembling the stem and branches of a tree is presented, which is called *arbor vitæ*.

principally composed of transverse fibres, connecting the lobes or hemispheres of the cerebellum. It contains, however, numerous longitudinal fibres, which connect the medulla with the cerebrum, and transverse fibres which connect it with the cerebellum.

The medulla oblongata is the upper part or capital of the spinal cord, and is contained within the cranium. The grey matter is enclosed within the white. The medulla is also like the rest of the centres, divided into two lateral halves. The surface of each half of the medulla, presents four eminences, called from their shapes the anterior pyramids, the olivary bodies, the restiform bodies, and the posterior pyramids.

Functions of the Encephalon.

From the earliest times the brain has been generally connected with mental manifestation. The Greeks made Minerva, the goddess of wisdom, spring from the head of Jupiter; they also uniformly represented him, and their wise men, with large heads. In the athletæ and Hercules we find the head small in proportion. As a general rule, the size of the brain will indicate its power, provided it contains a proportionate quantity of grey matter; structure is therefore as essential as size. Notwithstanding the innumerable observations and experiments which have engaged the attention of the greatest physiologists of ancient, and still more of modern times, the precise share which the different parts of the

brain exercise in the various functions with which it is obviously connected is by no means ascertained.

A short summary of the functions assigned to the principal parts of the encephalon, may not be uninteresting.

The cerebral hemispheres are, by most physiologists, considered as those organs by which the mind clearly perceives and retains sensations, forms ideas, reflects upon them, and performs acts of deliberate volition; they are therefore justly considered as the principal organs of the mind, and there is no doubt that, in most instances the size and development of the cerebral hemispheres, in comparison with the rest of the cerebro-spinal centre, will correspond to the mental power possessed by the individual.

The cerebellum was by Gall, the founder of phrenology, considered the organ of sexual desire. But as cases have occurred when there was either an entire absence of the organ, or disorganization without loss of sexual passion, in addition to the fact that castration in horses seems to augment the weight of the cerebellum, this view of its function is rejected by most physiologists. The opinions of Flourens and Foville are generally adopted. The former, from numerous experiments, came to the conclusion that it is the organ for the co-ordination of the voluntary movements, or for the excitement of combined muscular action. Foville holds that the cerebellum is the organ for the perception of muscular resistance and sensibility, which is requisite before the mind can act and exercise its will.

The pons Varolii.—From experiments it appears that, after all the encephalon, above the medulla, has been removed in an animal, it becomes insensible, and incapable of voluntary power; but if the pons is left, it still retains a dull sensibility, and some movements indicative of will. "It may, therefore, be an organ through which the mind receives impressions, or it may be a nervous centre for higher reflex acts, than the medulla oblongata, or any part of the spinal cord." *

The *medulla oblongata.*—The functions of this organ are most important. It may be considered as the common centre of the cerebro-spinal system, combining the influences of intellect, instinct, and motion. It is that part on which life more immediately depends. The brain may be removed and life maintained, so long as the medulla remains intact; but the moment this organ is injured, especially in the centre, the respiratory organs cease to act. From the medulla are also derived the motor impulses, necessary to the act of deglutition.

The *ventricles and corpora striata.*—Towards the centre and base of the cerebrum, the surface is inflected inwards, forming compartments, which have received the name of ventricles; there are four or five of them; two are called the lateral; they all communicate with each other. In their healthy condition they can scarcely be considered as cavities; in a diseased state they contain an accumulation of serous fluid. Along the floor of the lateral ventricles are seen streaks of white matter,

* Kirkes' Physiology.

passing through the grey substance of which they are mostly composed; they are thence called *corpora striata.*

The *tubercula quadrigemina* are considered as the organs by which the mind perceives the sensations of light; destruction of one of the corpora causes blindness in the opposite eye. As to the tubercula being organs of the intellect or of the affections, there is no evidence to support such an hypothesis.

The pineal gland is heart-shaped, and has derived its name from resembling the cone of a pine. As it occupies a place nearly in the centre of the brain, it was, by Descartes, considered as the seat of the soul. Its function is unknown.

The pituitary gland situated in a depression at the base of the skull, was formerly believed to act as a sewer to the brain, and discharge its excretions through the nostrils. It is still believed to act so by the vulgar. Its function is as little known as that of the pineal gland, neither body has any efferent ducts.

The Spinal Cord.—(Medulla Spinalis.)

Between the medulla oblongata and the spinal cord there is no distinct line of demarcation. Many anatomists consider them therefore, as one organ, and describe them as such. The line of separation adopted, is where the medulla oblongata escapes from the cranium, through the foramen magnum, or great hole in the base of the skull; after which it assumes the name of medulla spinalis, or spinal cord. The cord proceeds down the canal of the vertebral column until it reaches

the first or second lumbar vertebra, terminating in a filament of grey substance, called the *filum terminale*, which lies in the midst of the roots of many nerves forming the *cauda equina*. Besides the remarkably strong bony structure in which the cord is lodged, it is invested with the same membranes as the brain. The cord is also, like the brain, surrounded by a liquid called the cerebro-spinal fluid. Magendie, who has made it the subject of his investigations, ascribes to it various functions. It is certain that it imparts a certain degree of support by its pressure, and is well adapted to diminish the effects of concussion. The form of the cord is cylindrical.* It is, however, not uniform in thickness through its whole extent, but is enlarged at the lower part of the neck, whence the nerves of the arms originate; and, again at the lower part of the back, where the nerves of the inferior extremities have their origin. The substance is similar to that of the brain, but differently disposed, the cineritious matter forming the centre. The cord like the brain, medulla and cerebellum, consists of two symmetrical halves, called hemicylinders, united in the middle by a commissure, but separated in front and behind by a groove or fissure. Each half, again is marked by two longitudinal furrows, by which it is divided into three tracts, the anterior, lateral, and posterior columns.

The *nerves* consist of a number of filaments, which

* The length is in the adult from sixteen to eighteen inches; circumference, 12 lines at the smallest, eighteen at the largest part; weight from one-twentieth to one-twenty-fifth of that of the brain in the adult.

are more or less directly connected with the brain and spinal cord; from which, as from a common centre most of them proceed. They are distributed in the substance of nearly all the tissues. Of the termination of the nerves in the tissues, nothing certain is known; whether the filaments unite in loops, or terminate abruptly, or become gradually merged in the substance in which they are placed, remains (from the minuteness of the objects) as yet undecided.

Thirty-one pair of nerves spring from the spinal cord; eight from the region of the neck, twelve from the back, five from the loins, and five from the pelvis. These nerves issue from each side of the whole length of the cord; their numbers correspond with the intervertebral apertures, through which they pass. Each of these nerves arises from two roots, the one from the anterior column described above, and the other from the posterior column. The fibres from the posterior root swell into a ganglion, beyond which the two roots unite, and by intermingling their filaments, form a compound spinal nerve, containing fibres from both the roots.

Of no part of the nervous system has the function been more satisfactory explained than that of the spinal nerves. The constant office of the cerebro-spinal nerves is to convey impressions made on the parts to which they are distributed, to the nervous centre where they are perceived as sensations, or to convey from the centre the influence of the will to the muscles in which they are distributed, and by which some motion is to be performed. Now, from the cir-

stance that the roots, which spring from the anterior and posterior columns, unite and proceed in the same sheath to the tissues, it was formerly believed that they had the same functions to perform. But, although it has been long surmised that there existed in the nerves both sensiferous and motor fibrils, it was reserved for Sir C. Bell to demonstrate the fact by experiment. By laying open the spinal canal in a living animal, that distinguished physiologist ascertained that, on dividing the posterior roots, the parts to which they were distributed became deprived of feeling, retaining at the same time the power of motion. On the other hand a division of the anterior roots was followed by loss of motion, the sensation remaining perfect. This discovery of the separate office performed by each set of fibrils, explains what sometimes happens in disease; when a part is deprived of motion, retaining sensation; or, sensation may be impaired or abolished, while motion may remain. Complete paralysis of the part is only the result of the division of both roots.

The distribution of the nerves affords a fair index as to their functions. When the filaments of a nerve are lost in the substance of a muscle, we may conclude that it is a motor nerve. When we find that the nerve is spread on the skin, or on a mucous surface, it is generally subservient to sensation. If, on the other hand, the nerve seems confined to organs which receive special impressions, the nerves possess only a special but not common sensibility.

Reflex Function.

It has been stated that the nervous system is that part of our organism through which the mind acts: but there is no doubt, that the nervous system can act independently of the mind; that is, the actions are accomplished sometimes in spite of the will, and in many cases without consciousness. Thus, when the eye is exposed to a strong light, the impression received by the brain is reflected through the third nerve, the motor of the iris, which contracts without the individual being conscious of it. Food applied to the pharynx will induce an act of deglutition, independent of the will. Besides these, a great number of the most important movements are constantly going on within the living body, without our being conscious of it. Other reflex actions take place *with* consciousness, although the will has no share in it. The sudden application of cold to the surface will cause the respiratory muscles to act; a stimulus applied to the nose causes sneezing; an irritation of the larynx incites involuntary coughing. The phenomena of this class belong to what is called reflex function, implying that the impression passing from the periphery to the centre, is reflected from the centre to the circumference, or otherwise. In order that these actions should take place, it is necessary that the nerves acted upon should remain connected with the spinal cord or the brain. The cord is, however, quite sufficient for most of these actions; and, although the power exists in the

cerebro-spinal system in general, it is considered by some as the exclusive property of the spinal cord, as the motions can very easily be excited after the head of the animal is cut off. Dr. Marshall Hall and Mr. Grainger consider that there meet in the spinal cord four sets of nervous filaments; two are the same as commonly described as sensitive and motor filaments; the others analagous to them, are chiefly subservient to reflex actions.

This remarkable power of the centres to reflect the sensorial impressions into motor impulses, was known to and described by Whytt, Unzer, but especially by Prochaska, without exciting much attention, until Dr. Marshall Hall, by his indefatigable and mostly independent remarks, elucidated, and pointed out the great importance of these phenomena, and their influence on the well-being of the organism.

The spinal cord is thus said to represent automatic life. We act without attention in performing the common operations of daily life. In walking, for instance, the foot, on touching the ground, conveys an impression of its contact to the spinal centre, when immediately the muscles of the other leg are put into a forward motion—the new contact engendering again the subsequent motions.

The Nervous Agent or Fluid.

From various analogies, and from resemblance of the mode of development and propagation between the nerve-force and electricity, many physiologists

have regarded the two forces as identical. Some facts militate, however, against the identity of these forces. Most physiologists, however, admit that both nervous and muscular forces have a strong analogy to heat, light, electricity, and magnetism. The nervous agent is prepared in the brain, the spinal cord, and no doubt in all parts where grey or ganglionic matter exists; and is from them sent and distributed to the nerves.

Du Bois Reymond, the most recent investigator of organic electricity, considers electricity and nerve force to be at least equivalent. This physiologist was the first who derived—what Matteucci failed in doing—electric currents from the nerves; and he is of opinion that the electricity in muscle and nerve will probably ultimately prove to be, not the mere consequences of their organic processes, but the source of their activity.

Transmission of Impressions to the Brain.

An impression made upon the end of the nerves in communication with the skin, is, according to Professor Helmholz, of Kœnigsberg, transmitted to the brain with a velocity of about 195 feet in a second. Arrived at the brain, an interval of about one-tenth of a second passes before the will is able to give the command to the nerves, that certain muscles should execute a certain motion. This interval varies in different persons, and at different times in the same persons. It is probable that the command travels with the above velocity towards the muscle.

After the receipt of the command, about $\frac{1}{100}$ of a

second passes before the muscle is in activity. From the irritation of the sensitive nerves till the moving of the muscles, about $1\frac{1}{4}$ to two-tenths of a second is consumed. An impression made upon the great toe arrives about $\frac{1}{30}$ of a second later than from the ear or face. It is very probable that large animals, such as the whale and the boa constrictor, do not feel a wound inflicted at the extremity until after the lapse of a second, and that they require another second to defend themselves. In man, the distances to be traversed are so short, that their influence is not observed.

The impressions made on the sensitive nerves, and the motions whether voluntary or not, must cause a consumption of the force; but so long as an equilibrium is maintained between the demand, and the supply which comes from the nervous centre, the nervous system will generally be in a healthy condition.

The Cerebral or Cranial Nerves.

Although these nerves, twelve in number, are called cerebral, they do not, with the exception of the first and part of the second pair, proceed from the brain itself, but rather from the medulla oblongata.

Distribution and Functions of the Cranial Nerves.

1. The Olfactory Nerves are more closely connected with the hemispheres of the brain than any other. They are seen lying under the anterior lobes of the brain. They swell into a bulb, from which numerous

fibres issue; pass into the nose through a plate of one of the bones of the skull; and are ultimately distributed upon the lining membrane of the nose. The olfactory is essentially the nerve of smell, and is insensible to common impressions.

2. The Optic Nerves are also nerves of special sense. They pass along the base of the brain, and before they enter the orbits they unite with each other. The optic nerve, on entering the orbit, proceeds to the back of the eye, and penetrates the coats of that organ; it then extends into a very delicate web called the *retina*, which serves as a screen for the reception of the image falling upon it. As with the olfactory, a stimulant gives rise to a visual impression, without any sensitive or motor actions.

3. The third pair pass into the bottom of the orbit, and supply four of the six muscles which move the eye, and also the muscles which raise the upper eyelid. They also regulate the movements of the iris, and are almost entirely motor nerves.

4. The fourth pair supply the superior oblique muscle of the eye—which gives a rolling motion to the eye-ball, and turns it upwards, being thus instrumental in expressing certain emotions and passions; these nerves are called the pathetic nerves *(pathetici)*.

5. The fifth nerve (*Trigeminal*) arises by two roots, a larger and a smaller one; and it thus entirely resembles a spinal nerve; the larger resembling the posterior, and the smaller the anterior root of a spinal nerve. The whole nerve then divides into three branches, the opthalmic, the superior maxillary, and

the inferior maxillary. It is both a nerve of sense and of motion. The opthalmic division supplies the globe of the eye, the conjunctiva, the lachrymal gland, the forehead, the upper eyelid, and the surface of the nose. The superior maxillary branch supplies the remainder of the mucous membrane of the nose, and its cavities; the upper part of the pharynx, the soft palate, the gums, the teeth, part of the nose, the cheeks, and the upper lip. The sensibilitiy of all these parts depend mainly on the fifth pair of nerves. The inferior maxillary branch supplying sensitive branches to the lower part of the face, as the lower lip, and the interior surface of the cavity of the mouth, the gum and teeth of the lower jaw, and the greater part of the tongue. The motor branches of the third branch govern the muscles of mastication, &c.

6. The SIXTH arises from close to the pons, and entering the orbit of the eye, is entirely expended upon the muscle, called the abducens which turns the eye towards the temple.

7. The SEVENTH PAIR consists of two portions, or rather two distinct nerves, differing in texture, origin, distribution, and function. Modern physiologists distinguish them, by calling the hard portion *(portio dura)* the facial nerve. From the medulla it passes forward, accompanied by the auditory, entering along with that nerve the auditory passsage. The roots of the facial nerve cannot be proved to contain sensitive fibrils, but on emerging from beneath the ear, it receives many such fibres in its course, but the motor fibres are greatly predominant. The expansion of

the facial nerve has been compared to the foot of a goose. One division proceeds to the scalp, the forehead, and the upper eyelid; another down the chin; another down towards the neck, forming in its course connections with the fifth, eighth, ninth, and with some of the cervical nerves. While the skin of the face thus derives its sensitive fibres chiefly from the fifth, the movements of the muscles of the face are regulated by the portio dura of the seventh pair, upon which the expression of the face depends. It sometimes happens that one of these nerves is seized with temporary, or permanent paralysis. The effect is to destroy all the play of the features on that side, whilst the still active muscles, on the other side, which act antagonistic to it, add to the influence. The symmetry of the face is the result of the muscular contractions on both sides being nearly balanced. But if the right facial nerve be paralysed, the left muscles are no longer opposed, and the face and mouth are drawn towards the left or healthy side.

8. The AUDITORY NERVE *(portio mollis)* is a nerve of specific sense. It arises in the bottom of the fourth ventricle, and proceeds with the portio dura described as the seventh, to the internal auditory passage, where it divides into many minute branches, which are distributed to the several compartments of the labyrinth of the ear. There their extremities are washed by the liquid contained in that cavity, from which they receive vibrations productive of the impressions of sound.

9. The 9th pair (*glosso-pharyngeal*) supplies the tongue and the pharynx. It arises in filaments from the medulla, and passes out of the cranium in company with the tenth and eleventh pairs. It is connected with the lower maxillary division of the fifth, with the facial, the trunk and branches of the pneumo-gastric, and the sympathetic. After leaving the skull, it appears between the internal carotid and the jugular vein. It subsequently changes its direction, and curves inwards to the tongue, where it ends in branches distributed to the pharynx, the tonsils, and the tongue. Branches are supplied to the mucous membrane of the tongue and pharynx, and also to some of the muscles of these organs.

Functions.—It is only recently that the functions of this nerve have been made the object of experimental research. It is generally believed to be a mixed nerve, destined partly for sensation and partly for muscular motion. That it is not the special nerve of taste is sufficiently clear from that function being still performed, although not to the same extent, after the division of the nerve. It is considered (especially by Müller) as partly a motor nerve.

10. Pneumo-Gastric Nerve.—This nerve, called, from its distribution to many organs, the *nervus-vagus*, has the longest course of any of the cranial nerves. It arises from the medulla by filaments, which unite into the form of a flat band; and extends through the neck and chest to the abdomen. In its long course, branches are sent off to connect it with other nerves, and to supply the ear, the pharynx, the larynx, the lungs, the heart,

and lastly the œsophagus, with which the pneumogastric nerves enter the abdomen, and are spread on the surface of the stomach, where they terminate.

The branches which supply the pharynx and the larynx, require a more minute description. The pharyngeal branch arises from the upper part of the trunk of the nerve. In its progress to the pharynx, its branches, with others derived from the glosso-pharyngeal, superior laryngeal, and sympathetic nerves, form a plexus behind the middle constrictor of the pharynx, from which the branches proceed both to the mucous membrane, and the muscular fibres of the pharynx.

Superior Laryngeal.—This branch springs from the middle of the ganglion of the trunk. Beneath the internal carotid, it divides into two branches, the external and internal; the former gives filaments to the pharyngeal plexus, and the lower constrictor muscle, and proceeds to the crico-thyroid muscle and the thyroid body, where it terminates. The internal branch is continued to the interval between the hyoid bone and the thyroid cartilage.

Inferior Laryngeal.—This branch, from its peculiar reflex course to the larynx, called the *recurrent nerve*, arises on the right side from the vagus, at the top of the thorax; it hooks round the subclavian artery, and passing upwards and inwards, reaches the trachea. On the left side, the recurrent nerve winds round the arch of the aorta, and passes upwards towards the trachea. Immediately after it leaves the trunk of the vagus, it anastomoses freely with the branches of the sympathetic. Each nerve, in its course to the larynx,

is situated between the trachea and œsophagus, supplying branches to both those tubes; whilst most of the filaments of the internal branch of the superior laryngeal are distributed to the mucous surface, and most of the filaments of the recurrent are distributed to the muscles. The muscular branches, in short, supply all the proper muscles of the larynx, except the crico-thyroid.

Functions of the Par Vagum.—From the circumstance that this nerve extends over so large a space, forms connections with other nerves, and supplies so many important organs, it has been studied with the greatest attention by physiologists. There prevails, however, still considerable uncertainty with respect to the functions of this nerve. According to Stilling, the superior laryngeal branch is purely sensitive, and possesses no influence on the general motions of the *rima*, whilst the inferior laryngeal branch has but little sensibility, and is chiefly the motor nerve of the larynx, which is rendered sensitive by the superior branch. The vagus is generally considered to contain motor fibrils, although it is probable that it receives the greater part of them from the spinal accessory. This is, however, by no means certain.

11. Spinal Accessory Nerve.—This nerve arises from the lateral column of the spinal cord, as low as the sixth cervical nerve; it passes upwards, where, on entering the skull, it receives filaments from the *medulla oblongata*, and passes out of the skull, in the same sheath of the dura mater as the pneumo-gastric. On escaping from the cranium, it divides into two branches, the

internal, and external. The internal immediately comes in contact and blends with the vagus, one portion forming part of the superior pharyngeal branch, another portion accompanies it down the neck, with the external division of the accessory.

Functions.—The peculiarity of the origin and connection of this nerve has given rise to many speculations. Sir C. Bell considered it as a respiratory nerve of involuntary motion. Most physiologists of the present day are of opinion that it supplies the vagus with motor filaments. Bernard, although he does not maintain that the fibrils of the accessory reach the internal muscles of the larynx, calls it the vocal nerve; and, as it provides the muscles which raise the thorax and prevent its collapse, he also terms it the nerve of singers, who mostly work with the expiratory muscles.

12. Hypoglossal (or *Lingual*).—This nerve arises from the medulla, the filaments unite into two bundles, which pass through the occipital bone. The principal branches of this nerve are distributed to the fore part of the neck, and to the tongue. It is connected with the pneumo-gastric, the gustatory, the sympathetic, and some spinal nerves, and it supplies most of the muscles connected with the hyoid bone and the tongue.

Function.—This nerve was formerly considered the nerve of taste, but is not so now; the trifling sensibility which it possesses, is chiefly owing to the gustatory branches of the fifth. Most physiologists agree that it is the principal motor nerve of the tongue; its importance in relation to deglutition and articulation, is sufficiently obvious. On dividing it, the animal loses

all power over the motions of the tongue, which when drawn out of the mouth, it is unable to retract.

THE PHRENIC NERVE.—In describing the mechanism of respiration it was stated, that the principal agent in that process was the diaphragm. Although this important organ is supplied with nerves from various sources, its healthy action chiefly depends on the *phrenic* nerve, so called, from the ancients having considered the diaphragm as the seat of the mind. This nerve arises from the roots of the third and fourth cervical nerves, and having descended the neck enters the chest. In its course it receives filaments from other nerves, and is distributed on the under surface of the diaphragm.

If this nerve be divided in a living animal, *dyspnœa*, *i. e.* a great difficulty of breathing will be the result, as the respiratory movements will have to be performed by the other muscles connected with the chest and abdomen. On dividing the cord *above* the issue of the phrenic nerve, respiration ceases at once.

CHAPTER III.

SOUND.

When the particles composing any body are by some disturbing force thrown into a state of agitation, they will communicate it to the surrounding elastic bodies. The alternate motions, which are the result of the disturbed equilibrium of the component particles, are termed *vibrations*, waves, undulations, or oscillations. On striking a bell the particles driven in by the force of the blow are urged back beyond their former position by repulsion, and again carried beyond their position of repose by cohesive attraction. The adjoining parts being necessarily affected, the whole mass will partake of the vibratory motion, which will only cease after a certain time.

These vibrations may be transmitted through any substance, liquid, solid or aëriform; but the ordinary medium by which the undulations are propagated, is the air; and the sensation produced, when these vibrations reach the auditory apparatus is termed Sound.

Like other sensations, sound can scarcely be said to exist independent of the hearer. That a medium for transmitting the vibration is requisite for the production of sound, is proved by the common experiment of ringing a bell under an exhausted receiver, when the sound is hardly perceptible; but becomes distinct in proportion as air is re-admitted. The vibrations may be felt and seen. If a tuning-fork be struck, and stopped with the fingers, a peculiar sensation will be felt arising from the fork rapidly striking the finger. On taking a square or ronnd piece of glass or metal, and strewing upon the surface fine sand or non-adhesive powder, and drawing the bow of a violin along the edge, the sand will be displaced, and will be thrown away from the parts which vibrate towards those which are at rest. This method of studying sound-vibrations was first devised by Chladni—hence the curious forms produced have been named Chladni's acoustic figures.

Propagation of Sound.

Sounds may be propagated to very great distances. Dr. Hearn heard guns fired at Stockholm, at the distance of one hundred and eighty miles; and the report of the guns in a battle between the Dutch and the English, 1672, is said to have been heard in Wales, at a distance of two hundred miles. A great deal will necessarily depend on the state of the atmosphere. When a strong wind blows from the hearer against the sounding body, the sound which might be audible in a calm will not be heard. On the other hand a calm

and frosty atmosphere, over a level surface, enabled Lieut. Forster, of the Polar Expedition, to converse with a person on the opposite side of Port Bowen, at a distance of a mile or more.

It is also stated that in the morning, before sunrise, the voice, and occasionally the laugh of the sailors on board of an English man-of-war, at anchor off Spithead, have been heard at a place in Portsmouth. On the authority of Derham,* the human voice has been heard across the Straits of Gibraltar, more than ten miles.

Velocity of Sound.

The rapidity with which sound is transmitted, will depend on the medium which propagates it. The velocity of sound through the air will vary according to its density or rarefaction.

The average velocity of sound in the air, at 62 degrees, is about 1120 feet per second. Thus, by noting the time which elapses between the flash and the report of fire-arms, the distance of the sounding body from the hearer may be ascertained. Sound is transmitted with much greater velocity through some liquids and solids than through the air, but it does not readily pass from one medium to another. A sound made in the air is not easily distinguished under water, though the distance be not great. Water conducts sound four times more rapidly than the air. Solids convey sound with still greater velocity. Of

* Philosphical Transactions, 1708.

the metals, iron conducts sound the fastest—sixteen times faster than the air, and tin the slowest. Of the woods, white deal and pine seem to be the fastest, and oak, walnut, and yew, the slowest conductors of sound. Whalebone, like all cellular bodies, is a bad conductor of sound, as it has successively to pass through various media.

In the same medium, however, all sounds, however different in pitch or intensity, are transmitted with the same velocity; otherwise music as an art could not exist; for if the various notes of different instruments were to reach the ear at different moments, a most disagreeable effect would be the result.

Reflection of Sound.

When waves of sound meet an elastic surface they are partly transmitted, and partly reflected, producing an echo. That an echo should be distinctly heard, it is requisite that the reflecting surface should be of sufficient magnitude, and at such a distance, that the original sound should have ceased to be audible before the reflected sound returns; unless this be the case the sounds will be blended, and the echo indistinct, or not perceived at all. If the reflecting surface be at a distance of 1,120 feet, the sound of a syllable will return two seconds after it has been uttered; but, as only eight syllables can be distinctly articulated in two seconds, the speaker must cease speaking to hear it, otherwise the returning sounds will become confounded with his own.

Distinction between Sounds.

Sounds are distinguished from each other by their intensity, pitch, clang, or "timbre."

The *intensity* or loudness depends on the extent of the vibrations of the sounding body. By varying the force of concussion, and rendering it more or less violent, in disturbing the arrangements of its parts, we can from the same body produce at will sounds differing in loudness. The intensity will also depend on distance, and sound seems in this respect subject to the same law as light, that it will diminish in force, in proportion to the square of the distance. This, however, relates only to the air. By confining the sounds within tubes, so that the rays cannot diverge, but are successively reflected from the sides of the tube, whispers may be rendered audible at considerable distances.

The *pitch* or tone depends upon the number of vibrations in a given time, and is distinguished into grave or flat, and acute or sharp. The less frequent the vibrations of a sounding body, the graver will be the tone produced; the more rapid the vibrations, the more acute will be the sound. It had been generally assumed that the gravest sound which the human ear is capable of perceiving is formed of thirty-two vibrations in a second, and that the capacity for the most acute sound extended only to 12,000 vibrations in a second. Savart, on the other hand, from numerous experiments, has come to the conclusion that the per-

ceptive power of man in relation to musical sounds, extends from 7 vibrations to 24,000 per second, nor does he consider these figures as the extreme limits.

Dr. Wollaston considered that human hearing extended but a few notes above the cry of the *gryllus campestris*. The doctor had known several persons whose hearing was generally good, who had never heard the chirping of the house cricket, and he concluded that the hearing of certain notes did not depend so much upon the intensity of the sound, as upon the pitch or frequency of vibration. It is said that in an average company of six persons, one will be found who cannot hear the chirp of the short-eared bat, one of our most acute animal sounds.

Intensity of Sound during the Night.

That the intensity of sound increases during the night has been remarked in remote antiquity. Aristotle in his problems, and Plutarch in his dialogues alluded to it. It might at first appear likely that in uninhabited places, the prevailing stillness during the night, owing to the absence of various sounds, such as the humming of insects, the songs of birds, would sufficiently account for the acute perception of distant sounds.

This explanation, however, does not apply to regions, such as the forests of the Orinoco, where the buzzing of innumerable insects with which the air is filled is much stronger during the night, and where the wind only rises after sunset. Alexander von Humboldt is

of opinion, that the presence of the sun influences the propagation and intensity of sound. When the air is calm and homogeneous, no matter whether it be dry or charged with moisture, the sound is propagated without difficulty. But when the air is crossed in every direction by small streams of air of a higher temperature, and of different densities, the sound waves are partially reflected, and experience a change in direction, by which the intensity is diminished. During the night, however, the surface of the earth cools, and becomes more uniform in temperature; and the atmosphere is no longer crossed by streams of warm air, which in a perpendicular or oblique direction ascend during the day. The medium being thus rendered more uniform will propagate the sound without obstruction, whilst its intensity will be increased, as the division and partial reflection of the sound waves is diminished.

The timbre, quality, expression, or clang, depends on the nature of the vibrating body. By timbre or clang we understand a certain peculiarity which enables us to distinguish between two similar notes produced with equal intensity.

A distinguishable sound composed of double the number of vibrations of another sound is said to be its octave, and the intermediate seven sounds constitute the diatonic scale or gamut.

Musical Instruments.

Vibrating Strings.—A stretched string of wire or catgut, will, like a pendulum, vibrate more frequently

the shorter it is. A tense string will yield its deepest tone, or fundamental note, when it vibrates in its entire length; if now its length be halved by a bridge beneath it, the rate of vibration of either half will be doubled, and the sound emitted will be the octave of the lowest note. The law is, that the rate of vibration of such a string is inversely as its length. Thus, if one-fourth of the string be isolated, the vibrations will be four times as frequent as those of the fundamental note, and the sound produced will be the second octave.

The number of vibrations corresponding to the different notes of the gamut are as follows:—

							Octave.
1	$\frac{9}{8}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	$\frac{15}{18}$	2
C	D	E	F	G	A	B	C
ut	re	mi	fa	sol	la	si	ut

That is to say; that to produce the note D nine vibrations will be made, while eight only are made in the same time to produce the note C. Five vibrations of E will correspond to 4 of C, and so on until the octave C, when two vibrations will correspond to one of the fundamental note C.

Wind Instruments differ essentially from other instruments, that in them as in the horn, flute, flageolet, organ, &c., the column of air contained in the tube is the sounding body. In order to produce sounds, the air must be made to vibrate. The various sounds which are produced by instruments of this sort depend on the length, form, and width of the tube, on its

openings on the side or extremities. The nature of the material of which the instrument is formed has little influence upon the sound. Thus, a flute may be made of ivory, wood, or metal, if it be of the same form and length, it will yield the same note. The material employed will only influence the *timbre* of the sound.

Reed or Tongued Instruments.—The simplest tongued instrument of this kind is the Jew's harp. In order to produce the sonorous vibration, the thin lamina is struck with the finger, the bars being held between the teeth, or it can be made to vibrate by drawing a current of air into the mouth. The sound yielded by a reed or tongue is altered in pitch when a tube is superadded, as in the clarionet, hautboy, and bassoon.

The pitch of the tongue may separately differ from that of the tube, yet by their combination only one note is heard, which may be neither the fundamental note of the reed, nor of the column of air in the tube when sounded without the reed.

Membranous Tongues.—Bodies made elastic by tension will, like short tongues made of wood or metal, give no sound when struck, but are capable of being thrown into sonorous vibration by a continuous current of air.

Müller found that the length of a prefixed tube, which conveys the current of air to a membranous tongue, has the effect of lowering the pitch of the sound produced; but when the lengthening of the tube has reached a certain point, the tone suddenly rises to the original pitch. Tongued instruments are

rendered still more complicated by the addition of a tube above the tongue. To know the respective influences of these tubes would be of great importance, as in the organ of the voice, the larynx and bronchi represent a tube prefixed to the membranous tongue, and the cavity in front of the vocal cords a tube placed beyond the tongue.

Membranous tongues made elastic by tension, may have either of three following forms:—

1. That of a band, extended like a cord, and included between two firm plates, so that there is a cleft for a passage of air on each side of the tongue.

2. The elastic membrane may be stretched over the half portion, the other part being occupied by a solid plate, between which and the membrane is a cleft.

3. Two elastic membranes may be extended across the mouth of a short tube, each covering a portion of the opening, and having a chink between them.*

The last form is, in relation to speech, the most interesting, and has consequently most engaged the attention of experimental inquirers.

* Müller's Physiology.

CHAPTER IV.

THE ORGAN OF HEARING.

The Auditory Apparatus is composed of three parts: the external, the middle, and the internal ear.

The External Ear consists of the Auricle or Pinna, and the *meatus auditorius externus* (auditory passage). A well formed ear presents five eminences and three cavities. The central cavity, which leads to the auditory passage, is named the *concha* (shell).

The *meatus auditorius* is composed partly of bone, and partly of cartilage. Beneath the skin of the outer or cartilaginous part, are a number of glandular bodies which secrete the cerumen or ear wax. The tube is in the adult about an inch in length.

The Middle Ear comprises the cavity of the *tympanum* (drum), the mastoid cells contained in the bony prominence behind the ear, and the Eustachian tube.

The tympanum is separated from the auditory tube by a thin membrane named the *membrana tympani*.

The cavity of the tympanum, which is always filled

with air, contains three small bones, which, from a resemblance to certain implements, have been named the *malleus* (hammer), the *incus* (anvil), and the *stapes* (stirrup). Besides these, there is a minute spherical bone, the *os orbiculare*, frequently considered to be merely a process of the incus.

These small bones, which form a chain extending from the *membrana tympani* to the *fenestra ovalis*, have small muscles attached to them, which are not under the dominion of the will, but seem to act automatically, corresponding to the impressions made on the auditory nerve.

The *fenestra ovalis* is an oval shaped opening, situated nearly opposite to the *membrana tyupani*, and communicates with the vestibule. Lower down, beneath a projection named the promontory, there is another aperture, the *fenestra rotunda*, leading into the *cochlea*.

Besides these openings from the tympanum, a canal, named the Eustachian tube, passes from the cavity of the tympanum in an oblique direction and opens in the superior part of the pharynx. This tube is like the auditory passage, partly bony, and partly cartilaginous, and is about an inch and a half to two inches in length. The mucous membrane which lines the canal is continued over the surface of the cavity of the tympanum; hence an inflammation from cold or sore throat will frequently extend to the ear, and cause temporary deafness.

The Internal Ear, or labyrinth, comprises the *cochlea*, the semicircular canals, and the vestibule.

The *cochlea*, resembling a snail shell in structure,

consists of a tube wound round a central axis. The three cylindrical cavities, termed the semicircular canals, terminate in the vestibule, which is the common central cavity of the osseous labyrinth, and communicates with all parts of the anditory apparatus.

The internal ear, which is formed of the hardest part of the temporal bone, is covered with a thin fibrous membrane, and is filled with a liquid named the *perilymph*, or liquor of *Cotunnius*. Within the cavities just described, which constitute the osseous labyrinth, is the *membranous labyrinth*, which contains a fluid called the *endolymph*. The vestibular portion of the membranous labyrinth contains two cavities, of which the larger is called the *utriculus*, and the lower the *sacculus*. The utricle and the sac contain a calcareous deposit called *otoconia*, or ear sand. The acoustic nerve, from its softness called the *portio mollis* of the seventh pair, enters the labyrinth in two divisions: one for the cochlea, and the other for the vestibule, whence the branches spread out and radiate in the inner surface of the membraneous labyrinth, where they appear to mingle with the ear sand.

Functions of the External Ear.

THE structure of the auricle or *pinna* evidently shows that it is intended to influence the propagation of sound to the tympanum, by collecting the sonorous vibrations and directing them towards the meatus. The sonorous undulations which enter the passage obliquely, reach the membrana tympani by reflexion. The concha

directs the reflected undulations into the meatus, and is thus the most important cavity of the external ear. Many animals have the power of moving the ear in direction of the sound. With few exceptions, man does not appear to possess this faculty; the respective muscles being mere vestiges, and undeveloped. The *meatus auditorius* transmits, like any other tube, the sonorous undulations to the membrane of the tympanum.

Functions of the Middle Ear.

The membrana tympani being highly elastic, and stretched in its osseous ring, is thrown into vibration by the sonorous undulation conducted to it by the auditory passage, and in its turn transmits the sound to the air and to the osseous chain contained within the drum. The small bones, which are moveable by various muscles, modify the tension of the membrane, rendering it at one time sensible to weak impressions, and at another prevent intense sounds from affecting it too strongly. They transmit the vibration to the fenestra ovalis, which leads to the vestibule—the central part of the internal ear.

Functions of the Eustachian Tube.

The principal use of the Eustachian tube seems to be to renew the air in the tympanum and the mastoid cells: and to maintain an equilibrium between the air in the tympanum and the external air, so as to prevent too great a tension of the membrane. The Eustachian tube has also the office of carrying off the mucus secreted within the cavity of the tympanum.

Functions of the Internal Ear.

NOTHING certain is known respecting the special functions of the particular parts of the labyrinth. In regard to the cochlea, it has been surmised that we are enabled by it to estimate the pitch of sound, especially of the voice. The semicircular canals are said to have for their function to receive the impressions by which we distinguish the direction of the sound.

We must, therefore, be satisfied to consider the labyrinth, as a whole, in which the sonorous undulations are brought to act through the medium of a fluid upon the auditory nerve, which transmits the impression to the brain, where it is perceived as sound by the mind.

Action of the two Ears.—We certainly receive two impressions, and yet perceive only one. It is said that this single preception is the result of our using one ear only at a time. That when addressed by two individuals who speak simultaneously into both our ears, we can at will attend only to one, and that then the sounds entering the opposite ear will become indistinct, is true enough, but is far from establishing the above theory. There can be but little doubt thatsingle perception of several sounds is the result of the sonorous undulation, being conducted through the same medium, reaching the two ears and the nervous centre simultaneously. Whenever the same sound is conducted through different media, it will be heard more than once.

Deafness may result from a great variety of causes.

Obstructions in the external auditory passage or in the Eustachian tube, which prevent the air from reaching the membrana tympani, and its renewal within the drum, generally cause partial deafness. Enlargement of the tonsils may have the same effect, by pressing upon the Eustachian tubes, or by extending the inflammation to the mucous membrane of the tube.

Destruction of the membrana tympani causes, in most cases, loss of hearing; which is sometime instantly restored by the introduction of an artificial membrane—an operation with which aural surgery has been enriched within the last few years. Deafness arises less frequently from alteration of structure of the labyrinth, or of the auditory nerve, than from affections of the external and middle ear. It can easily be ascertained whether the nerve is affected. If the patient can hear the tick of a watch held between his teeth, the nerve is not injured; the sound in this case is conducted by the bones of the head.

CHAPTER V.

THE VOCAL APPARATUS.

The respiratory organs, subservient to the phenomena of the voice having been already described, it will only be necessary to treat, in this place, of the structure and functions of those parts which are immediately concerned in their production.

The Larynx (figure 1.), which is the instrument for the production of vocal sounds, is situated in the anterior region of the neck, on the top of the windpipe, and is composed of five principal cartilages.

The cartilage which is connected by membranes and ligaments to the first hoop of the windpipe is named the *cricoid* (ring-shaped) cartilage. As it serves as a foundation for the superior parts it is very solid in structure. Above the cricoid, is placed the *thyroid* (shield-shaped) cartilage; it consists of two portions, which unite in front, presenting a prominence so perceptible in the adult male, called *pomum Adami*,

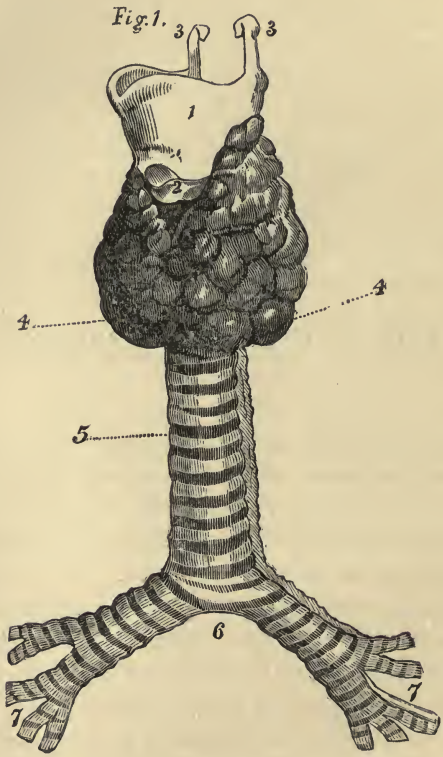


Fig. 1.

External aspect of the larynx, trachea, and thyroid gland. 1 Thyroid cartilage. 2 Cricoid cartilage. 3 3 The superior horns of the thyroid cartilage. 4 4 The thyroid gland. 5 The trachea. 6 Bifurcation of the trachea. 7 Subdivision of the bronchi.

(Adam's apple), from an idea that part of the forbidden fruit remained sticking in his throat.

The thyroid does not, like the cricoid cartilage, surround the larynx, but presents at its posterior margins prolongations upwards and downwards. The superior processes, called the great horns, are connected by ligaments to the tongue bone, whilst the inferior, or short processes, are connected by muscles and ligaments to the cricoid cartilage.

The *arytenoid* (ewer-shaped) cartilages are two in number, and much smaller than the others. They are placed on the highest part of the cricoid cartilage; they have a pyramidal shape, and are so connected to each other and the other cartilages by muscles and membranes as to be capable of motion in several directions. These cartilages are, in relation to the production of the voice, the most important, as the true vocal cords are attached to them.

The *epiglottis* is a broad leaf-shaped cartilage attached to the root of the tongue, and connected by ligaments with the other cartilages. The epiglottis is vertical in its usual condition, but becomes horizontal in the act of swallowing, when it covers the aperture of the larynx, and thus to a great extent prevents the entrance of foreign substances. Four other small cartilages (two of which are named the *cornicula laryngis*, or cartilages of Santorini, and two, the cuneiform, or Wrisberg's cartilages), may be simply mentioned as entering in the composition of the larynx. They consist of a yellowish soft substance; and have, like the epiglottis, which has also a spongy structure,

but little tendency to become ossified, an affection to which the other cartilages are more or less liable.

The LARYNX and the upper part of the trachea are embraced by a soft and highly vascular body called the *thyroid gland*, although it possesses no excretory ducts. This body, which weighs about an ounce and a half, is always larger in the female than in the male, and is occasionally of an enormous size, constituting the disease called *goître*. The actual function of this body is, in most physiological works, stated to be unknown. Professor Merkel, however, believes that it exercises some influence in the process of phonation, which had not hitherto been noticed.

"The gland," says Merkel, "being attached to the superior part of the trachea and the larynx, must naturally follow the movements of these organs. The thyroid body is further covered by certain muscles, such as the sterno-thyroid, sterno-hyoid, and omo-hyoid, and comes behind in contact with the large vessels and nerves of the neck. When the above-mentioned muscles contract and become thicker and harder the gland is compressed, and the displaced blood enriches the neighbouring larynx and its muscles at a moment when it is just required. The pressure which is experienced by the thyroid gland is also communicated both to the trachea and the larynx, thereby reducing somewhat the internal space of these organs. The contraction of the muscles of the neck exercise, therefore, not an immediate pressure upon the larynx, but upon the thyroid gland, which, acting like a cushion, distributes it equally on a large surface.

Owing to the soft and yielding substance of which it is composed, the gland adapts itself to all the motions of the larynx, and it is very probable, that in some process of phonation, when expiration is retarded, and an increased force of the muscles of the neck is required, the thyroid gland may serve as means to prevent too great a swelling of the blood vessels of the neck, by receiving a part of the stagnating venous blood. In such cases the gland exhibits in front a visible tumefaction."

Internal aspect of the Larynx. (Figure 2.)

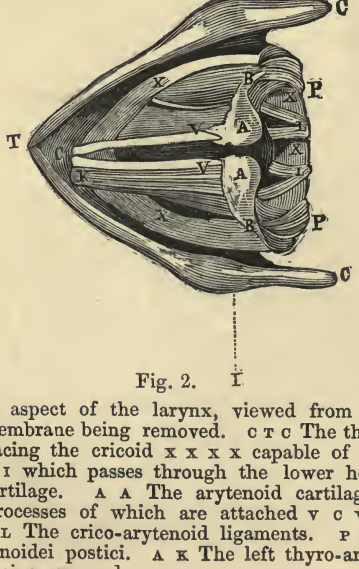


Fig. 2.

Internal aspect of the larynx, viewed from above, the mucous membrane being removed. C T C The thyroid cartilage embracing the cricoid X X X X capable of rotating on the axis I I which passes through the lower horns of the thyroid cartilage. A A The arytenoid cartilages, to the anterior processes of which are attached V C V the vocal cords. L L The crico-arytenoid ligaments. P B P B The crico-arytenoidei postici. A K The left thyro-arytenoideus, the right being removed.

On looking downwards into the larynx, the tube is seen gradually to contract. The narrowest part, which corresponds with the lower part of the arytenoid cartilages, is called the *glottis*. On each side may be observed two folds of the mucus membrane, which lines the larynx. These folds, which, are composed of highly elastic tissue, have received the name of vocal cords or vocal ligaments. The superior of these folds are much thinner than the inferior, and as they are proved to be less concerned in the production of the voice, are termed the *false* cords.

The inferior membranes, which are much thicker, are the organs chiefly concerned in the production of the voice; hence they are called the true vocal cords. The narrow opening between the inferior cords, is termed the *rima glottidis* (chink of the glottis). The cavities between the superior and inferior vocal cords are denominated the ventricles, and two cavities on the outer side of the superior ligaments are termed the laryngeal pouches.

Muscles of the Larynx.—Anatomists distinguish two sets of muscles which act upon the larynx:—1, the extrinsic; and, 2, the intrinsic. The former act, more or less, upon the entire organ, by moving it upwards or downwards; the latter give motion to the individual parts in relation to each other.

Besides the pharyngeal muscles, which are inserted into the cricoid and thyroid cartilages, may be mentioned the following muscles, which are chiefly concerned in elevating the larynx, viz:—The digastrici, stylo-hyoidei, hyo-glossi, genio-hyoidei, and mylo-

hyoidei. Their antagonising muscles which depress the larynx, are the sterno-hyoidei, the sterno-thyroidei, the thyro-hyoidei, and the omo-hyoidei.

The Intrinsic Muscles of the Larynx consist of one single muscle, the *arytenoideus*, and four pair: 1. The *crico-arytenoidei postici;* 2. The *crico-arytenoidei laterales;* 3. The *crico-thyroidei;* 4. The *thyro-arytenoidei.*

The *arytenoideus*, although considered as a single muscle, is, from the different direction of its fibres, divided into the oblique and transverse arytenoid. It is a short and thick muscle situated at the back of the larynx, arising from one arytenoid cartilage, and is inserted into the corresponding part of the other cartilage. It contributes to approximate the arytenoid cartilages, by which the posterior part of the chink of the glottis is contracted.

1. The posterior *crico-arytenoidei* arise from the posterior part of the cricoid cartilage; they are situated beneath the mucous membrane of the pharynx, and are inserted into the external process of the arytenoid cartilage. These muscles, when in action, cause the arytenoid cartilages to make upon their base a rotatory movement outwards, by which the opening of the glottis is widened.

2. The lateral *crico-arytenoid* muscles, which are smaller than the posterior, arise from the superior border of the cricoid, and are inserted by a tendon into the posterior surface of the arytenoid cartilage. They are situated deep between the thyroid cartilage and the crico-thyroid muscle. These muscles act in opposition

to those last named, by bringing the arytenoid cartilages back again; so that their anterior extremities being approximated, the opening of the glottis contracts.

3. The *crico-thyroid* are short muscles of a triangular shape, situated on each side of the anterior part of the larynx. They arise from the cricoid cartilage, and are inserted into the lower margin of the thyroid cartilage. By the action of these muscles, the cricoid is made to rotate on the thyroid cartilage at their posterior articulations, which are thus made to approach in front. As the cricoid is thus carried backwards from the thyroid, it carries with it the arytenoid cartilages, and the effect is, that the vocal cords are lengthened and tightened.

4. The *thyro-arytenoid* muscles are flat muscles, situated above the lateral crico-arytenoid. They arise from the internal surface of the thyroid cartilage. One portion of the muscle is inserted into the base of the arytenoid cartilage, and the thinner portion is inserted into the outer border of that cartilage. These muscles are, in relation to the production of the voice, highly important, as by bringing together the anterior processes of the arytenoid cartilages, they constrict the glottis, and by the action of the fibres attached to the outer surface of the vocal cords, they tighten these organs, and so change them into tongues capable of vibration.

Although the *rima* of the glottis is usually described as a single chink, it may be considered as consisting of two portions; an anterior between the vocal cords, which portion has been called the *vocal* glottis, in con-

tradistinction to the posterior portion between the arytenoid cartilages, which has been named the *respiratory* glottis.

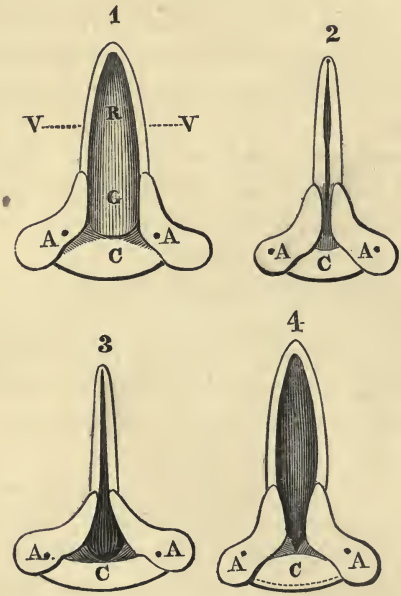


Fig. 3.

A A The arytenoid cartilages articulated upon C the crycoid cartilage. V V The vocal cords attached to the anterior processes of the arytenoid cartilages. G R The aperture between the vocal cords called the *rima glottidis* (chink of the glottis.)

1. Represents the glottis in its passive state, as in quiet respiration. The anterior processes of the arytenoid cartilages, acting like floodgates, being perfectly open. The glottis has then a triangular shape,

dilating somewhat during inspiration, and becoming narrower during expiration. The posterior part, marked G, is the respiratory part of the glottis.

2. Represents the glottis perfectly closed, which is the case in most acts of phonation. The closure is the result of the approximation of the anterior processes of the arytenoid cartilages, to which the vocal cords are attached.

3. Represents the anterior portion closed, and the posterior partially open. In this case the vocal processes of the arytenoid cartilages touch each other whilst their bases are diverging.

4. The glottis is here represented as open in its whole length; the basilar parts of the arytenoid cartilages are converging, whilst the vocal processes and consequently the cords are diverging; which, according to Merkel, appears to be the case in violent shrieks from anguish, and other emotions.

The glottis is under the dominion of the will, so that we can close it at pleasure, either during inspiration or expiration. It may, however, be closed independenly and in spite of the will by reflex action, as in laughing, sneezing, &c., or by affections of the nervous system.

CHAPTER VI.

THE ORGANS OF ARTICULATION.

In the organs described in the previous chapter are produced all the fundamental sounds of which *voice* consists; but the tones may, by the action of the organs composing the tube between the glottis and the external apertures, be so modified, that they become articulate sounds, a combination of which constitutes speech.

The *pharynx* is a membranous funnel shaped bag, about four and a half inches in length, situated behind the mouth and larynx. It is covered by mucous membrane, containing numerous glands, and terminates near the cricoid cartilage of the larynx, into the gullet, which is a continuation of it. The muscular fibres have, from the peculiarity of their arrangement, received the name of constrictor muscles, as they compress and propel the food into the gullet. Other muscles raise and widen the pharynx, which communicates with the nose, the larynx, the mouth, and the Eustachian tubes, and exercises a considerable influence on the modulation of the voice and articulation.

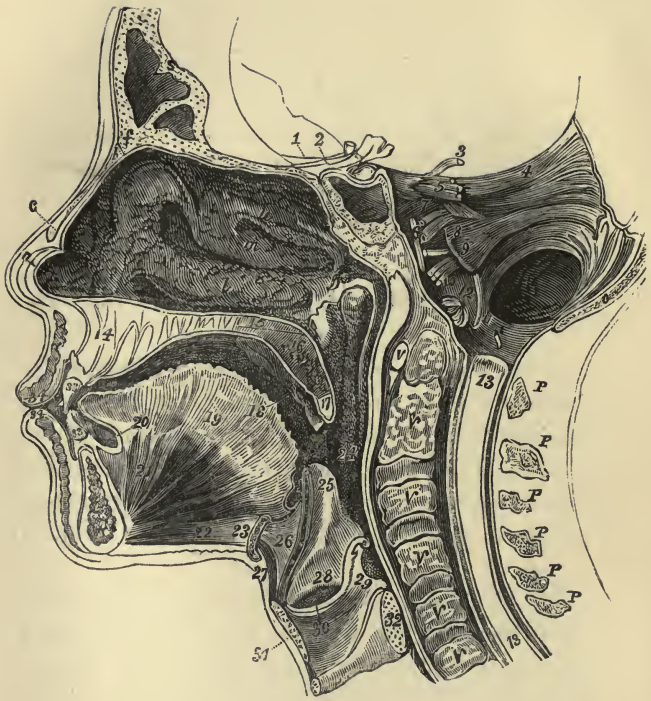


Fig. 4.

Median section of the head; *F*, frontal bone; *S*, frontal sinus; *B*, bone of the nose; *C*, cartilage of the nose; *N*, external nostril; *U*, upper spongy bone; *M*, middle spongy bone; *L*, lower spongy bone; *O*, occipital bone; *V*, vertebræ; *P*, the spinous processes; 1 to 12, the cranial nerves; 13, the spinal cord; 14, superior maxillary bone; 15, hard palate; 16, soft palate; 17, uvula; 18, tonsil; 19, tongue; 20, fraenum; 21, genio-glossus; 22, genio-hyoideus; 23, hyoid bone; 24, palato-pharyngeus; 25, epiglottis; 26, hyo-epiglottic ligament; 27, hyo-thyroid ligament; 28, superior ligament of the glottis; 29, arytenoid cartilage; 30, inferior ligament or vocal cord; 31, thyroid cartilage; 32, cricoid cartilage; 33 33, incisors 34 34, lips.

The *palate* forms the roof of the mouth, and consists of a *hard* and *soft* portion. The hard palate, formed of the superior maxillary and palatal bones, is covered by a dense corrugated mucous membrane, presenting in the middle line a ridge or raphé, which terminates in front in a small eminence. The *hard* palate offers a firm resistance, when during deglutition the food is pressed against it; and is subservient to the articulation of many sounds.

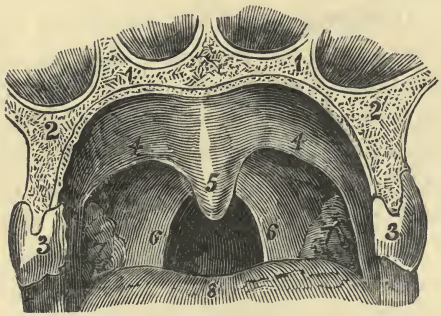


Fig. 5.

1 1, palatine process; 2 2, alveolar processes of the upper jaw; 3 3, posterior molar teeth; 4 4, anterior arches of the soft palate; 5, the uvula; 6, 6, posterior arches of the same; 7 7, the tonsils; 8, the tongue.

The *soft* palate (velum pendulum palati) is composed of mucous membrane, muscular fibres, and glands. Attached to the border of the hard palate, it forms a moveable curtain and partition between the mouth and pharynx. The process which depends from the middle is termed the *uvula*, popularly, the pap of the throat,

which, when relaxed, is called the falling of the pap. The uvula contains a small muscle, by the contraction of which it is raised up.

The folds formed by the velum are distinguished into the anterior and posterior arches; in the recesses between them are lodged the tonsils.

The *tonsils* (amygdalae, almonds) are glands of an oval shape, about six lines in length, and yield a fluid, which lubricates the fauces. They are very subject to inflammation, as they receive a large supply of blood. When enlarged, they may be felt beneath the skin, at the angle of the lower jaw. Their enlargement causes difficulty of swallowing, frequently deafness, and a peculiar nasal tone of the voice.

The *nose* is, besides being the organ of smell, a part of the respiratory and vocal apparatus; and exercises a considerable influence on the *timbre* of the voice. The anterior prominent part of the nose consists of bone, cartilages, and muscles, which move the latter and the anterior nostrils. The internal narrow cavities (nassal fossae), formed by the bones of the nose, are separated from each other by a partition, (septum nasi), composed of bone and cartilage. These cavities, which are lined with mucous membrane, communicate with hollows of the neighbouring bones, and open in the pharynx through the posterior nostrils.

The posterior openings of the nose into the pharynx (which are two nearly oval apertures about an inch in length, and half an inch wide, separated by an edge of the *vomer*,) being situated over the soft palate, that organ can be drawn up so as to close the apertures and

prevent the air from passing into the nasal canal, and also so as to preclude the food from passing into it during deglutition or vomiting.

Cleft palate consists in an abnormal communication between the mouth and the nose; the result of an aperture, which sometimes extends both through the hard and soft palates; or it may consist only in a small fissure in either of them. The inconvenience of the affection necessarily depends on the size of the fissure. The articulation is impaired by the air passing through the nose instead of through the mouth, so that the nasal sound predominates in the speech of persons so afflicted.

Fissures in the soft palate are operated upon in a similar manner as hare lip. The inconvenience of extensive fissures in the hard palate is greatly obviated by the application of a false palate, consisting of a plate of gold or silver, so adapted as to cover the aperture. The passage of food from the mouth to the nose, and *vice versâ* is thus prevented, and the patient, by being taught how to use the artificial apparatus, may have his articulation greatly improved.*

The *tongue* is, from the variety of functions which it has to perform, as an organ of taste, of mastication,

* "Mr. D. P. ætat 17, has a congenital fissure in the palate; articulates very imperfectly. The sound of his voice is very unpleasant, and many of his words are unintelligible.

"Six months after the operation, Mr. P. had made no improvement in his speech, when he put himself under the tuition of Mr. Hunt. In the course of a few weeks an extraordinary change was effected, and ere long, the articulation was so different that little more could be desired."—*Observations on Cleft Palate, by* WILLIAM FURGUSSON, ESQ., F.R.S., *Professor of Surgery to King's College.*

deglutition, and also of articulation, necessarily of a very complex structure. The tongue is connected by muscles to the soft palate, to the hyoid or lingual bone, and to the lower jaw; and again by the mucous membrane with the epiglottis, the pharynx, and the soft palate. The mucous membrane, which is reflected from the under surface to the gums of the lower jaw, forms in front a fold called the *fraenum linguae*.

The size of the tongue varies considerably, and seems to bear little relation to the size of the individual; the tongues of some persons being only half the size of those of others.

The apparatus subservient to taste and touch is contained in the covering membrane; whilst the substance of the tongue is chiefly composed of muscular fibres, which run in many directions, enabling the organ to perform an infinity of movements, and to assume a great variety of positions and changes of form.

The muscles of the tongue are distinguished in *extrinsic, intrinsic, and accessory*.

The extrinsic muscles are, according to the parts to which they are attached, named the *palato-glossi*, the *stylo-glossi*, the *hyo-glossi*, and the *genio-glossi*, connecting the tongue with the soft palate, the hyoid bone, the lower jaw, &c. They move the whole organ upwards, downwards, backwards, and forwards. The palato-glossi raise the sides of the tongue and constrict the fauces. The stylo-glossi, when acting alone, render the upper surface of the tongue concave and retract it. When both the stylo-glossi and the hyo-glossi act, the tongue is drawn backwards and inwards.

The tongue is rendered convex by the action of the hyo-glossi, which, when those of one side act alone, draw the tongue to the respective side. The genio-glossi are the largest of the muscles of the tongue, and have for their function to raise and to draw the tongue forwards, as in putting the tongue out of the mouth, or to draw the tip of the tongue backwards, and depress the tongue in the mouth.

The *intrinsic* muscles, also called linguals, which form the greater part of the substance of the tongue, consist of closely interwoven longitudinal, transverse, and vertical fibres. They alter the shape of the tongue, curve it upwards or downwards, and move it in a variety of directions.

By accessory muscles are understood such muscles which, though not attached to the tongue, are attached to its bone, the os-hyoides; for whatever moves the bone, must necessarily influence the tongue, which is fixed to it.

Morbid Affections.—The tongue is like every other organ, liable to various affections, which impede its motions. An abnormal enlargement of the tongue may either be congenital or the result of inflammations. The enlargement proceeds in some cases gradually in infancy, displacing the front teeth and protruding beyond the mouth. The fraenum may extend too far forwards or be too short, so as to impede the movements of the organ; the individual is then said to be tongue-tied. The affection mostly diminishes in proportion as the organ is used. The operation of dividing the fraenum, formerly so frequent, and

engendering considerable inconvenience in after life, should be only resorted to when it interferes with the functions of sucking and swallowing, or when it materially affects the articulation. Generally speaking, when the child can put the tongue out of the mouth, no incision is necessary.

An opposite condition of the organ is when its movements are so free that it can be thrown back into the pharynx, from which suffocation may result, which sometimes happens to children. This is called tongue-swallowing, which, according to Magendie, Beck, and others, is resorted to by some negroes to commit suicide.

Considering that the tongue possesses greater mobility than any other muscular part of the frame, and exposed as it is to so many mechanical injuries from the teeth, hot liquids, acrid aliments, &c., it appears remarkable that it is so little subject to inflammation. This appears to confirm a physiological hypothesis: that the more an organ is supplied with nerves, the loss is it liable to inflammation.

Loss of the Tongue.—Although this organ is justly considered as the most important instrument of articulation, so that tongue and language are considered as convertible terms, yet certain it is, that the absence of the tongue, whether congenital or caused by disease, does not necessarily produce incapacity of vocalisation and articulation, nor even absence of taste. Numerous well authenticated cases are recorded of individuals who, though deprived of this organ, possessed taste and the faculty of speech.

Justin speaks of men upon whom Honorichus, King

of the Vandals, had exercised the atrocity of cutting out the tongue, and who, nevertheless, retained the power of speech. When the Turks invaded Austria, many were maimed in a similar way. Tulpius (observ. med.) saw one in Holland who could articulate those consonants and words which depend on the tip of the tongue for pronunciation. In the third volume of the *Ephemerides Germanicæ*, a similar case is mentioned of a boy, who, at the age of eight, lost his tongue by the small pox, and who could speak. He was examined before the Academy of Saumur, and received a certificate to that effect.

Jussieu exhibited, in 1718, to the Academy of Sciences, a girl born without a tongue, who yet could speak, swallow, and taste. Louis Richter and other authors mention similar cases.

The following case is described by Dr. Parsons, in the *Philosophical Transactions of* 1747.

Margaret Cutting, of Ipswich, lost the whole of her tongue, together with the uvula, when only four years old, from a cancerous affection, yet she retained the powers of speech, taste, and deglutition, articulating as fluently as other persons. She also sang admirably, and could form no conception of the use of a tongue in other people. The Royal Society were not satisfied with the report of the commissioner whom they appointed to inquire into the case, and to set the matter at rest, had the young woman conveyed to London, where she was examined in persno before that learned body. When we consider that the tongue is neither the sole organ of taste, which it shares with the

cheeks, the lips, the palate, &c., nor the only organ of articulation, the cases are not so very extraordinary; but merely exhibit the wonderful resources of nature in bringing into action the other organs which must vicariously do the work of the tongue.

The *mouth* includes the whole space from the lips to the throat, and is, from the movements of the lower jaw, capable of great alterations in size and form. The cavity is lined by mucous membrane of a rosy colour.

The *lips*, which form the anterior opening of the buccal cavity, are covered externally by a layer of skin, and internally by mucous membrane, between which are contained numerous glands, nerves, vessels, and muscles. The upper lip, which projects a little beyond the lower, presents in the centre a groove, which is a continuation from the septum of the nose. The lips unite at the lateral ends and form angles. On the inside the mucous membrane forms folds which connect the lip with the gum; these are the *fraenulae*, of which that of the upper lip is much the larger.

The principal muscle of the lips is, from its circular shape, called the *orbicularis oris*, with which are connected the greater number of the muscles of the face. The lips are of the greatest importance as organs of expression and articulation; many sounds depending on them. They moreover enable the infant to suck and retain the saliva in the mouth. The upper lip has frequently one or more fissures, constituting a serious malformation called a single or double hare lip, and requiring the aid of the operative surgeon.

The *cheeks* are, like the lips, composed of a layer of

skin, mucous membrane and muscles, besides numerous glands, vessels, and nerves. The principal muscle of the cheek is the *buccinator*.

The *teeth* in the human subject consist of two sets. The first set, twenty in number, being only intended to last a certain period, are called temporary, and differ from the second set in size and texture. In the great majority of cases the change of the temporary or milk teeth for the permanent commences about the seventh year; when, as the permanent teeth are already ossified, there are forty-eight teeth in the jaws.

The thirty-two permanent teeth are divided into incisors, canine, and molars. The four teeth in the fore part of each jaw are the incisors, so named from their use in cutting and dividing the food. The canine or *cuspidati*, derive their name from their resemblance to a dog's tusk; those in the upper jaw are also termed eye-teeth. One canine tooth is placed on each side of the incisors. The molars or grinders, of which there are ten in each jaw, are divided into the small or false, and the true grinders. The true grinders are twelve in number, three of them are placed on each side of the false grinders. The last grinders have, from not coming through the gums until at a later period in life, received the name of wisdom teeth. The variation in the number of teeth, which is frequently met with, mostly depends on the appearance of the last molars. The teeth exercise an important influence not only on articulation, but also to some extent on the voice.

CHAPTER VII.

PRODUCTION OF THE VOICE.

If a sufficiently large aperture be made in the trachea of an animal *beneath* the larynx, the voice is lost: but if made *above* the larynx, the voice continues. Many cases are recorded of persons, who, from fistulous openings in the trachea, were unable to speak unless the apertures were stopped by mechanical appliances.

When the larynx and trachea of an animal is taken, and air blown into the latter with some force towards the larynx, while the arytenoid cartilages are sufficiently approximated, so that their inner borders nearly touch at their anterior processes, a sound is heard somewhat resembling the voice of the animal to which the organs belonged. The sound produced will vary in gravity or acuteness in proportion to the approximation of the cartilages, and the intensity of the sound will depend upon the force with which the air is made to pass through the glottis.

When the larynx of a living animal is, either from accident or an operation, so exposed that the internal parts can be seen in action during the production of the voice, the inferior vocal cords are seen to vibrate, whilst the superior ligaments or the false cords are apparently passive.

Again, when in a larynx cut from the body all the parts above the glottis are removed, provided the inferior cords remain uninjured, tones may still be produced by impelling the air through the chink of the glottis.

From what has been stated, it follows: that the voice is produced in the larynx, the trachea acting chiefly as a *porte-vent*, to convey the air to the glottis; that the inferior vocal cords constitute the essential organ of the voice; and that the superadded tube, comprising all the parts and passages above the glottis, merely modifies the sounds which are produced in the glottis.

The reason why no tone is produced during ordinary respiration is not solely owing, as generally stated, to the dilated state of the rima, which becomes narrow during expiration, but also to the circumstance that although the vocal cords may be sufficiently approximated, yet they are not stretched by their respective muscles, and consequently do not resist the expired air. It must, moreover, be borne in mind that to produce any vocal sounds, volition is generally necessary to call the muscles of the larynx, as well as those of respiration, into action, in order that the air should be propelled with sufficient force into the larynx. All the parts composing the larynx may perform the requisite motions,

as when we speak or sing in imagination, yet no sound is produced, owing to the absence of the requisite propelling force of the expired air.

It being then admitted that the inferior ligaments are essentially concerned in the production of the voice, physiologists have been at considerable pains to solve the difficult problem, both with regard to the action of the various parts of which the vocal organ is composed, and also to determine the kind of instrument to which it bears the greatest resemblance.

Most of the older writers considered the larynx as a wind instrument. According to these authors, the air which was forced from the lungs was obstructed by the ligaments, and thrown into vibration, which gave rise to sound. Under this theory the air *alone* was considered as the sounding body. The acute sounds they conceived were the result both of the contraction of the vocal ligaments and the shortening of the trachea; whilst the grave sounds were said to be the result of the dilation of the glottis and of the elongation of the trachea, which last was considered as the body of the instrument, and the glottis as the beak.

This theory was objected to on the ground that the larynx actually *ascends* during the production of acute sounds, and descends in the formation of grave tones, which is just the very reverse of what they imagined to occur in the process of phonation.

Claude Perrault (1680) was probably the first who explained the production of the voice on mechanical principles, and endeavoured to prove that the trachea exercised no direct influence upon the voice,

which he contended was produced in the larynx alone; and that the tone was grave when the cords were slackened, the *rima* elongated, and the air impulses slower; the acute tones he considered were caused by opposite circumstances.

Ferrein promulgated, in 1741, his celebrated theory that the larynx must be considered a *stringed* instrument. According to this hypothesis, the varieties of tones were at once accounted for by the different degrees of length and tension of the vocal cords, which were considered as strings. To produce acute tones, these cords were required to be stretched and shortened, and thus their vibrations, in a given time, increased, whilst the reverse occurred in the production of grave sounds.

A variety of experiments was, in support of this theory, performed before the French Academy. Air was forced from the trachea into the dead larynx both of the human subject and animals, while different degrees of tension was given to the cord. From the results obtained, Ferrein deduced that the different tones were not produced so much by the state of the aperture of the glottis, as solely by the state of tension and length of the cords. Some of the members of the committee, however, did not agree with Ferrein as to the actual results obtained: but maintained that the cords seemed rather to act like *reeds*, and not like strings.

In the reed instrument two parts are distinguished—the tube or body, and the reed. The reed is generally formed of one or two laminæ, capable, by their rapid

motion, of alternately intercepting and permitting the passage of the air current. Biot, Magendie, Weber, and others, were of opinion that the larynx was a kind of reed instrument; that the tube had some influence in the production of the sound; and that the lips of the glottis were the reed which by the action of certain muscles, is rendered fit for vibrating.

Savart (1825) dissented from the opinion that the larynx was a reed instrument, and denied that the organs of the voice resemble it. In the theory of the reed, no use is assigned to the ventricles, the superior ligaments, and the epiglottis, which Savart considered important parts in the production of the voice. He contended that the source of the voice was really the air in the ventricles, between the inferior and superior cords; and that the human vocal organ was in its essential parts analogous to the hunter's whistle or bird-call of sportsmen. But independent of the circumstance that the superior ligaments are altogether absent in some mammalia, the theory is not tenable, owing to the facts already stated; namely, that all the parts above the inferior cords may be removed without the voice being lost; and that an aperture in the ventricles, which admits of the escape of the air, does not deprive animals of voice.

The most complete examination of the whole subject in modern times is that made by Professor Müller, of Berlin, and published by him in his "Physiologie des Menschen." The conclusions now generally adopted, to which he arrived from numerous elaborate experi-

ments made on the natural and artificial larynx, are; *that the human larynx* is a kind of *reed instrument, with a double membranous tongue;* and that the sound is the result of the vibrations of the vocal ligaments, which are regulated by the same laws as other metallic or elastic tongues.

"Ferrein's experiments," says Müller "by which he demonstrated the resemblance of the vocal cords to vibrating strings, are among the best that have been instituted. He showed that the vocal cords sound according to laws analogous to those of strings thrown into vibration by currents of air, and that the notes are not altered by difference in width of the aperture of the glottis. From half the length of the vocal cord he obtained the octave of the fundamental note, and from two thirds, the fifth. Lastly, he found that a change in the length of the vocal cords to the extent of from two to three lines was sufficient to produce all notes of various pitch. My experiments on caoutchouc tongues afforded parallel results. I cannot assent to Biot's remark, when he says, 'What is there in the larynx that resembles a vibrating string? Where is the space for such a string of sufficient length to yield the lower notes of the voice? How could sounds of the compass which the human voice presents be produced by a string which the larynx would contain? The simplest principles of acoustics are sufficient to refute this strange notion.' Biot's objection can easily be controverted."

"A string, however shortened, would still be able to

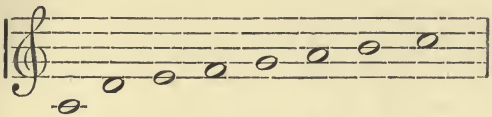
yield deep notes, if at the proper degree of relaxation, it retained the necessary elasticity for vibration. The elastic membranes and the laminæ of caoutchouc retain this elasticity when greatly relaxed."

"In one respect, however, the vocal cords differ from strings; and this point of distinction is important enough to give to them, with other membranous tongues, a special place among musical instruments. When strings are more strongly struck, *deeper* notes are produced; the note given out by a membranous tongue is, on the contrary, *raised* by a stronger blast, the extent of one, two, or more semitones; and if the tongues be of moist nature, as the vocal cords and bands of arterial tissue are, even to that of many semitones. The note emitted by a tongue depends, therefore, not only on the tongue itself, but also on the air giving the impulse. A string, on the contrary, being once struck, its vibrations undergo no further modification by the continued impulse; but, once excited, the vibrations are regulated only by the length and tension of the string."*

Singing.—The art of singing may be said to consist in the power of so applying the vocal organs, that the sounds produced should succeed each other at certain intervals, and in a determinate order, fixed by certain laws. This succession of vocal sounds, in which not only each sound has the requisite number, but the relative proportion of vibration, characterises the notes of the musical scale, which being evidently pointed out by nature, is nearly the same in every part of the world.

* Müller's Physiology, translated by Dr. Baly.

The expression of these sounds, by means of notation now in use, is thus :—



C	D	E	F	G	A	B	C
ut	re	mi	fa	sol	la	si	ut
do	re,	mi	fa	sol	la	si	do

It will thus be observed that this natural scale as already indicated (page 62), consists only of seven notes, for when, after singing or playing these seven notes, the series is continued, another scale similar to the first is repeated, according to the extent of the voice or the instrument. The last of the above notes, C, being the eighth from the first, is called *its* octave, and the whole series is called an octave.

The mode of applying to these seven notes certain syllables, which contain the first five vowels, is called the art of solmization, or sol-fa-ing. The syllables, ut, re, mi, fa, sol, la, selected by Guido d'Arezzo, from a stanza of a hymn to St. John the Baptist, were found insufficient when the hexacord system was abandoned, and the syllable *si* was added by Le Maire, a French musician. The syllable *ut* was finally rejected by the Italians, and *do*, which is also adopted in England, substituted for it.

When these notes or sounds are used in such succession, that a pleasurable feeling is produced in the

mind, the tune produced is said to be melodious; and it is almost certain that the pleasure arising from musical sounds is the result of the equal times of the vibrations which produce them, and of the equal length of the sonorous waves which reach the ear through the atmosphere. When two or more notes are produced at the same time in an agreeable manner, harmony is formed. The difference between melody and harmony, in relation to the perceptive power of man, seems to be, that melody, being natural musical language, is appreciated by most human beings; while harmony is in most cases understood only by persons who have cultivated music as an art.

There are many persons who, without ever having had any instruction in the science of music, have naturally such a nice perception of musical sounds, and appear so instinctively to be sensible of metrical precision, that they feel distressed at dissonance, and pleased at harmony. Persons so constituted are said to have a good ear.

A curious paper has just been communicated to the French Academy of Sciences, by M. Jobart, touching a sound corresponding to the note *la* (the note A in the English notation), which is heard by some persons in shaking their heads rather smartly from right to left.

M. Cagniard de la Tour* had been the first to remark

* Fabricius ab Aquapendente had already maintained that he possessed voluntary power over the muscles of the tympanum, and could at will produce a peculiar noise in his ears. Mayer knew a person who possessed this power in such a degree, that another person could distinctly hear the sound. Müller

the fact, and although he was known to be an exact observer, the announcement was received at the time with incredulity, because the experiment was generally repeated under unfavourable circumstances, by being interrupted by other slight sounds, such as the rustling of a cravat, &c. M. Jobart has investigated the subject physiologically, and has ascertained that the sound is caused by the striking of the *malleus* upon the *incus* in the interior of the ear. It is well known that the *manubrium* of the malleus is attached to the centre of the tympanum, and that it is kept in equilibrium by elastic fibres. Now, in shaking the head, the malleus may, in touching the bone of the incus, produce a slight metallic sound, which all who have heard it, say, agrees with the note *la*, in music. "Those," says Mr. Jobart, "that hear the note in both ear, are endowed with a perfect sense of hearing, and are born musicians. Those who hear the note in one ear only possess the sense in an imperfect degree, just as those who have one eye weaker than the other frequently mistake one colour for another. Those whose ears emit different notes not in unison, are not only bad musicians, but they actually hate the art. From this fact, M. Jobart deduces a consequence, which, if verified by experience, may be extremely useful in selecting a profession for

has the same power of producing a sound at will in either ear; and one of the most eminent English writers has just informed the author that, by shaking his head for a second, he hears distinctly a metallic A natural, but much more strongly in the left ear than in the right.

a child, by first ascertaining whether the subject hears the note in question equally in both ears.

Register of the Voice.—Many persons have the power of producing three varieties of notes, viz., the chest-voice, *voce di petto*, the head voice, *voce di testa*, and the *falsetto*.

The chest-voice, or the natural register, is that which is most under our control, and in which we usually speak and express ourselves.

The *head voice* is by some physiologists and music masters, distinguished from the falsetto; there being many singers who possess a register which can neither be said to belong to the chest notes nor to the falsetto. This intermediate register, which is softer and weaker than the chest-voice, forms the transition to the falsetto. According to Liskovius, the ligaments are in the production of the head-notes more stretched than in the production of the chest-notes.

This modification of the voice only occurs in such notes which can be produced both by the chest and falsetto voice; and the artist avails himself of it in the gradual transition from one note to the other.

The peculiarity which consists in a kind of soft and tender piano, retaining at the same time its harmonious quality has also been termed *mezza voce*, for the beauty of which Jenny Lind, Sontag, and Catalani were much admired.

The falsetto, which differs from the chest-voice, not merely in pitch, but in quality, has given rise to considerable difference of opinion in regard to the mode

of its production. Some have maintained that the vocal cords vibrate only half their length, and that the rima is partly closed. Lehfeldt first observed the fact, that in the production of the falsetto, the thin borders only of the glottis vibrate. Müller and most physiologists are of the same opinion. Peterquin and Diday, (*Gazette Medical*), however, contend that the falsetto notes are *flute* notes, not produced at all by the vibration of the vocal cords, but by the vibration of the air as it passes through the glottis, the glottis changing from a reed to a flute-like instrument, whilst in the production of the chest-voice, the whole breadth of the cords is thrown into vibration.

The falsetto voice certainly acquires in many cases a flute or flageolet-like tone, hence called flautino, and is chiefly employed in the highest sounds. The frequent employment of these notes gives, from the straining of the cords beyond their natural condition, pain to the singer, and is not unfrequently disagreeable to the listener. Physiologists differ as to females possessing falsetto voices; the higher notes in the female register are by some music masters called the head-voice; still the flute-like timbre of the highest notes evidently have the characteristic of the falsetto. Others consider that the falsetto is a *defect* of the voice; this may be the case when the chest-voice has not the normal compass, but not otherwise.

Garcia, as it appears from an article in the *Gazette hebdom.* No. 46, 1855, is able to hold in the pharynx a foreign body without much inconvenience. In this manner he introduces a speculum, which enables him,

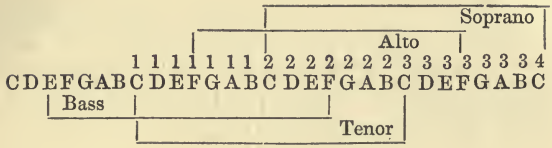
or a second person by means of an external mirror, to observe the changes in the glottis. Segond, who reports the various observations made in this manner, says that he is now convinced that the superior ligaments which formerly he considered as concerned in the falsetto, influence only the *timbre* of the voice, whilst the lower ligaments are the essential organs of the voice. During the transition from a chest-note into the falsetto, the ligaments approached each other and vibrated in their whole depth; they became relaxed in the falsetto and touched only at their edges, while the lateral parts were raised by the current of air.

Extent of the Voice.—The compass of the voice varies in different individuals from one to three and a half octaves, the ordinary compass being about twelve notes.

A good singing voice includes about two, or two and a half octaves. Some distinguished female singers are able to bring out an octave more.* The entire scale of the human voice, the compass of the male and female voices being taken together, includes four octaves. But the male and female voices commence and terminate at different points; the lowest note of the female voice being about an octave higher than the lowest note of the male voice, while the highest note of the male voice is an octave lower than the highest note of the female voice.

* Sessi, a young female singer, had a compass of three octaves and three notes, and Catalani's voice included three and a half octaves.

The following table exhibits the entire scale of the human voice and the mean extent of its varieties.



In this table, the scale is commenced at the C of the eight-feet organ pipe, or the fundamental of the fourth string of the violoncello.

The intermediate voices, viz., the barytone in males begins at A, and reaches F2 or higher. The mezzo-soprano begins at A1 and reaches A3 or higher.

The compass of the voice of an individual depends both on the elasticity of the vocal cords and their tensile capacity, and on the functional powers of the muscles concerned. Well organised vocal cords of an adult will admit of being so stretched as to increase one third in length, and exhibit a compass from two to two and a half octaves. The voice, however, does not merely depend on the increase of the length, but also on the *lateral* tension of the cords. It may also happen that though the vocal cords are in excellent condition, the muscles may be incapable of effecting the requisite tension.

According to Müller, the mean length of the vocal cords* is as follows :—

	Male larynx.	Female larynx.	Boy of 14 years.
Mean length of the vocal cords in repose	$18\frac{1}{4}$	$12\frac{2}{3}$	10·5
Mean length of the vocal cords in the state of greatest tension	$23\frac{1}{6}$	$15\frac{2}{3}$	14·5

From these measurements, it appears that the relative length of the vocal cords in the male and female larynx are as three to two, both in the extended and relaxed state.

As the compass of the voice may be extended above the medium note, by the use of the falsetto, so may it be extended in depth. When the singer, especially the basso, descends below the deepest note of his natural voice, the tone is no longer sonorous, but rattling, and becomes gradually (about an octave below the medium note) so faint that the number of vibrations can no longer be recognised. To produce the gravest tone of the voice, the larynx is depressed about half an inch below its mean position, by which the rima is opened in its whole extent, and the tension of the ligaments is very slight. Generally speaking, the notes will be deeper and more weak, the fainter the impulse of the air. When the larynx is in the lowest position, the tone becomes from a diminished action of the air not only deeper, but

* The numbers indicate millimetres. A millimetre is about $\frac{1}{25}$ of an English inch.

scarcely audible. Again, in ascending from the lowest to the highest chest-notes, the larynx gradually rises until it reaches about half an inch above its mean position, and the aperture of the rima diminishes in breadth in proportion as the larynx ascends; and as generally the tone is rendered more acute, by a more forcible impulse of air; we may ascend from pianissimo to fortissimo by gradually increasing the air current.

CLASSIFICATION OF VOICES.—As males, as well as females, differ in the pitch of their voice, musicians distinguish three principal kinds of male voices; the bass, the barytone, and the tenor; and three kinds of female voices: alto, mezzo-soprano, soprano. The *bass*, which is the lower voice, is almost entirely a chest voice, it surpasses all others in power, but exhibits a considerable degree of roughness.

The *tenor*, which has received this name from being the chief sustaining voice, is softer, more flexible, and expressive than the bass. Some of its higher notes belong to the head voice.

The *barytone* is the intermediate voice between the bass and the tenor.

The *alto** is the lower female voice, and, as all its sounds are from the chest, their tone is full, but mellow.

The *mezzo-soprano* is like the barytone, the intermediate voice between the alto and soprano.

The *soprano* (*discanto*) is the higher female voice,

* Literally, alto means *high voice*, from being higher than the tenor, which was considered the leading voice.

the tones of which, though not so full as that of the alto, excel it much in freshness, and in the power of expressing the passions. The highest sounds of it belong to the falsetto.

These various kinds of voices depend both on the dimensions and length of the vocal ligaments. Other circumstances must, however, also be taken into consideration. An elastic ligament of a certain thickness will yield a deeper tone than a ligament of the same length and tension, but thinner in structure. The cords of old people are, as Harless found, much thinner, while those of children are much thicker in proportion to their length. The character of the voice is also, besides this, determined by the elastic capacity of the cords. Stretched ligaments must, *cæteris paribus*, yield a higher normal sound than slackened cords ; and it is chiefly upon this difference that the varieties of tenor, barytone, and bass, in men, and alto, mezzo-soprano, and soprano depend. The ligaments of high tenors and sopranos are, according to Merkel, generally proportionally thinner, though not narrower than those of bass and alto singers.

It is difficult to say which of the varieties of voice just noticed is to be considered as the most perfect. Many physiologists and musicians give in males the preference to the barytone, and in females to the mezzo-soprano. The barytone is not only intermediate between the deep bass and the somewhat effeminate tenor, but is generally distinguished by greater compass, metal, and flexibility. The barytone seems to be the normal male voice ; and the most celebrated male

singers, although they made sometimes their debûts as tenors, possessed in reality barytone voices. For the same reason the mezzo-soprano is preferred in females. Catalani, Mara, Malibran, Heinefetter, Clara Novello, were mezzo-soprani. It is moreover undeniable that barytones and mezzo-soprani usually preserve their voices unimpaired to a late period of life. Pasta, Catalani, Mara, delighted audiences long after they had reached three scores and ten.

Influence of the Auxiliary Organs on the Voice.

The Trachea.—The variation of length of the trachea, as the prefixed tube, seems to have but little influence on the note produced in the larynx; although it exercises a marked effect on the height of notes produced by tongues of caoutchouc or arterial tissue. It is, however, admitted that the elongation of the superadded tube above the glottis, facilitates, by the *descent* of the larynx, the formation of deep notes, whilst its shortening by the *ascent* of the larynx, favours the production of high notes.

The Ventricles.—The chief office assigned to these cavities is to afford sufficient space for the vibration of the vocal cords. The ventricular sacs appear, moreover, to supply the vocal cords with the requisite moisture, whilst they are vibrating. Savart maintained that the air may vibrate in the ventricles, independent of the vibration of the glottis, and may produce sounds in such cases, when the other elastic parts are incapable of sufficient tension.

The *resonance* of the human voice is much influenced by the state and size of the ventricles of the larynx, the fauces, the oral and nasal cavities, and the development of the frontal sinuses. Professor Owen is of opinion that the want of resonance, for which the voice of the Australians is remarkable, is probably owing to the fact that the frontal sinus is not fully developed in that race. The parts above the glottis may thus, with regard to resonance, be considered as producing the same effect as a short speaking tube.

It may also be stated that, during the production of the chest-notes, the whole thorax resounds, and its vibration may be felt on placing the hand on the chest.

The influence of the epiglottis on the voice appears to be, that by being pressed down so as to cover the larynx, the notes are rendered deeper and somewhat duller. "In uttering deep notes," says Müller, "we evidently employ the glottis in this way; such, at least, seems to me the object of the depression of the tongue when, endeavouring to produce very deep notes, we press down the head."

Bennati observes that the soft palate rises and assumes an arched form in grave sounds, and sinks in acute sounds. The uvula maintains its normal position in grave tones, but nearly disappears from sight in the highest acute sounds. The importance of the uvula in the formation of the voice is considerable; if it be of an abnormal size or deficient in contractile power, the quality and intensity of the voice greatly suffers.

The tonsils, according to the same authority, swell

and approach each other in high tones ; large tonsils thus favour the falsetto voice, but interfere with the quality of the chest notes.

The tongue, in relation to the voice, is less active in grave sounds, when it maintains its usual position. In acute sounds, as in the falsetto, the edges of the tongue rise and form nearly a conical cavity, the apex of which is the tip of the tongue. Singers possessing a full chest-voice have usually a large tongue.

Mutation of the Voice.—It has been seen that the larynx of boys resembles that of females; the vocal cords in boyhood being only two-thirds of the length they subsequently acquire. Between twelve and sixteen in girls, and fourteen to eighteen in boys, the larynx enlarges, and the voice undergoes a change both in timbre and compass. As the alteration in the vocal apparatus of girls is not so great, the change is not so marked. Girls generally preserve the kind of voices they possessed before mutation, but the compass extends both in depth and height; nor does it unfrequently happen that a soprano changes into an alto voice, the reverse being rarely the case.

The alto and soprano voices of boys become, when properly developed, bass, barytone, or tenor. In some boys the change is effected in a few days,* in others many weeks and months elapse before the character of the voice is formed. During, and for some time after

* It is said that the celebrated Lablache found his voice changed into an excellent bass in a single night, after having on the previous day taxed his voice to the utmost at a festival of the church.

the change, the voice is unsteady and crowing, and remains so until the new tones are brought under perfect control. The full developement of the voice keeps pace with that of the body, and may, with proper care, be preserved in its full integrity until the fortieth or fiftieth year, rarely until a later period.

There obtains, among physiologists and music masters, a great difference of opinion with regard to the cultivation of the voice during the critical period of its change. Some maintain that the voice should not be exercised at all at this period of life. The majority, however, are of opinion, that provided due caution is observed, the exercises need not be entirely suspended. It is of considerable moment that both the master and the pupil should closely watch the predominating quality of the voice which is likely to be the result of the change, and to adapt the exercises accordingly. All efforts to force the voice should be strictly avoided. Even after the change has taken place, and the quality of the voice is determined, male singers should be cautious of forcing the acute tones. Some considerable time after the full development of the chest-voice, the cultivation of the falsetto—if this register exists—may with due caution be proceeded with. It may at the same time be mentioned that not only is the falsetto of the male voice, when forced, injurious to the voice, but at present but little cherished.

Inspiratory Voice.—The production of the voice is not, as was formerly believed, necessarily connected with expiration, for man can both speak and sing during inspiration. The tones so produced are generally harsh

and unequal, and as the glottis dilates in inspiration, the phonetic process must be more difficult and fatiguing.

This inspiratory voice differs from the normal voice in being about an octave higher. According to Segond, it has two registers; that of the chest-voice is more extended in the low notes than that of the normal voice, and that of the falsetto in the high ones. The articulation of many letters is altered, if formed during inspiration; and some, especially *r*, cannot be produced.

The voice of some batrachians is solely inspiratory; and the variety and continuity of the notes of singing birds may be explained by the fact that the voice is produced both during expiration and inspiration. To this must be added the influence of the volume of air extended through every part of the bodies of birds, and which can be forced into the larynx after the air in the lungs is nearly exhausted.

Besides the sounds produced in the larynx, there are other sounds which may be produced either in the posterior or anterior part of the tube above the larynx. The vibrations of the arches of the soft palate, cause snoring. A variety of sounds may also be produced by the air being pressed between the lips, which are thus made to vibrate. The pitch of the notes thus produced will depend on the comparative tension of the lips, which, in such cases, represent a reed instrument.

The musical sound called *whistling*, which is produced in the oral cavity, was by Munke* considered as the effect of the vibration of the edges of the lips. That whistling

* Gehler's Physikal. Wörterbuch.

is not entirely owing to the vibration of the lips, is easily proved, as the sounds may be produced though the lips are covered or touched. There appears but little doubt that in whistling, which may be produced both during inspiration and expiration, the air is the source of sound, being thrown into vibration by the friction against the borders of the aperture of the mouth. Müller agrees in his theory of whistling with Caignard la Tour, but he is of opinion that the latter has attached too little importance to the influence of the oral cavity.

Whistling, as Savart has shown, bears a great analogy to the sounds of a pipe or flute, and the difference between the two sounds appears to be, that, in whistling, the whole column of air is in constant motion through the orifice; while in a pipe the air vibrates merely in the tube, and does not move as a current.

Timbre of the Voice.

By *Timbre* (stamp) is understood the peculiar character, quality, or clang of the voice, by which every individual is known. Geoffray Saint Hilaire, Dutrochet, and Magendie, are of opinion, that just as the timbre of a violin depends not merely on the nature of the material, but also on the proportions of its parts, so does the timbre of the voice depend on the form and hardness of the cartilages of the larynx. Thus the larynx of the child being soft, the voice is shrill and squeaking. In the adult, the parts become denser, and the voice is properly developed, whilst the cracked and

disagreeable voices of old people are the result of partial ossification of the cartilages.

The timbre of the voice, does not, however, merely depend on the structure and shape of the cartilages. The form and development of the vocal cords, the dimensions of the ventricles of the larynx, the disposition of the buccal and nasal cavities, the shape, position, and form of the tongue, soft palate, and the teeth; all these, separately or in combination, contribute more or less to give to the voice its character. As the causes may thus be said to be infinite, and as the timbre is the result of their combined action, it is not astonishing that two voices are rarely, if ever, found to be absolutely alike.

Timbre and pitch are frequently confounded by writers. The distinguishing characteristic of the pitch of a note, is the number of vibrations by which it is produced, independent of the nature of the vibrating body; the pitch consequently represents *quantity*, while the timbre represents the *quality* of the sum of the vibrations. Pitch thus designates the degree in musical sounds whether grave or acute; timbre, the peculiar clang, or as it has been called, the colour of the sound.

Blandet (Compte rendu, Sept., 1846) considers that the pharynx and the tonsils exercise a great influence on the timbre. The excision of the tonsils causes the loss of four upper, and the gain of two lower notes. The thyroid cartilage may laterally be so compressed that three upper notes may be gained, and two falsetto notes may be changed into chest-notes. The superior

ligaments vibrate also, and only increase the sound. Blandet further observes, that one vocal cord may be destroyed by disease, and the voice not lost, so that man can speak with one cord as he can see with one eye, or hear with one ear.

Nasal timbre.—In the normal state, the sound produced in the larynx escapes both by the mouth and the nostrils. When either of these two passages are closed, or when any one attempts to speak or sing more than usually through one channel, the tone acquires that disagreeable quality called the nasal timbre. The defect arises therefore from two opposite causes. When the dorsum of the tongue is raised, and the soft palate descends, the air can only partially flow out by the buccal cavity, in which case the current passes through the internal nostrils into the nasal cavities, and escapes by the anterior nares. This is properly called the nasal *twang*, and the common expression, "speaking through the nose," is sufficiently correct. The same effect on the tone is produced by obstructions in the nasal fossae, either from inflammation of the mucous membrane, or by holding the nose, by which the sound is prevented from escaping by the nares. In this case, the person does not speak through the nose at all, but through the mouth. By altering, therefore, momentarily, the normal action and position of the auxiliary vocal organs, many persons can, for a certain time, imitate the timbre of the voices of other individuals.

Dr. Carpenter (*Principles of Physiology*) makes the following striking remarks on the precision with which the degree of muscular contraction in the glottis can be

adapted to produce a designed effect. "The natural compass of the voice in most persons who have cultivated the vocal organs, may be stated at about two octaves, or twenty-four semi-tones. Within each semi-tone, a singer of capability could produce at least ten distinct intervals; so that of the total number 240 is a very moderate estimate. There must, therefore, be 240 different states of tension of the vocal cords producible by the will; and as the whole variation in the length of the cords is not more than one-fifth of an inch, even in man, the variation required to pass from one interval to another will not be more than 1-1200th of an inch. And yet this estimate is much below that which might be made from the performance of a practised vocalist. It is said that the celebrated Madame Mara was able to sound 100 different intervals between each tone. The compass of her voice was at least three octaves, or 21 tones; so that the total number of intervals was 2,100, all compressed within an extreme variation of one-eighth of an inch; so that it might be said that she was able to determine the contraction of her vocal muscles to nearly the seventeen-thousandth of an inch."

Some physiologists have endeavoured to calculate the changes of which the human organ of voice is susceptible, on the assumption that the number of changes must at least equal the number of muscles employed. Considering that at least seven pair of muscles belong to the larynx, and that they can act singly, or in pairs, or in combination with the whole, or with part of the next, they are, according to Dr. Barclay's estimate, capable of producing upwards of

sixteen thousand different movements. When to the proper muscles of the larynx are added those attached to the cartilages and the hyoid bone, which may act independently, or in co-operation with those of the larynx, the estimate would have to be very largely augmented. But as all the respiratory muscles have directly, or indirectly, an influence in the production of the voice, the changes which they are capable of producing in the relative position of the vocal organs, will scarcely admit even of an approximate calculation. The number of movements of which the vocal apparatus is susceptible, and the varieties of tone which it can produce may be said to be beyond conception.

From the foregoing account of the anatomy and physiology of the human organ of voice we cannot but come to the conclusion, that it is of too complex a character to admit of a definite place being assigned to it among the instruments produced by art. Strong arguments, supported by experiments, may be adduced in favour of each of the three principal theories which compare the larynx either to a wind, stringed, or reed instrument. That the larynx bears a closer resemblance to reed, than to wind and stringed instruments is sufficiently established, and generally admitted; yet though "amongst them, it is not of them," but stands alone, combining in a wonderful manner the excellencies of all known instruments. Müller, the great expounder of the reed-theory, is at last forced to admit that "Although the organ of the voice belongs to the class of reed instruments, and though these reeds, when combined with a system of compensating pipes are, with

the violin, the most perfect of instruments, yet still the vocal organ is more perfect in being capable of giving, with *one* tube, all the notes and all the possible variations of the scale, while in the most complete instrument constructed of reed-pipes, each note requires a special pipe."

And such must ever be the result when the most perfect instrument conceived by the human brain, and executed by the human hand, is placed in juxtaposition with, and compared to a living organ, the work of Unerring Wisdom.

The Voice of Animals.

In the *mammalia* the fundamental structure of the larynx generally resembles that of man, and the mode of producing the voice is nearly the same. The intensity of the sound and peculiarity of timbre by which the voices of the various mammalia are distinguished depend on the different degree of development and some peculiarity of structure of the respective organs. Some few species only are mute, as the armadillo, the giraffe,* &c. The vocal organs of the mammalia, and especially of the *quadrumana*, have been studied and described by Cuvier, Lehfeldt, and especially by Brandt.

The intensity of the voice is in some animals much increased by peculiar organs of resonance. Some of the "howling monkies" of America, although by no

* The vocal ligaments are said to be absent in the giraffe.

means of a large size, possess voices which may be heard at a distance of a couple of miles. This power is owing to certain pouches connected with the larynx and to a large drum-like development of the hyoid bone.*

Voice of Birds. The vocal organs of the feathered tribe differ essentially from those of all other classes, in being furnished with a double larynx.

The larynx on the top of the trachea is partly cartilaginous and partly osseous: but its chief function appears to be the regulation of the respiratory process. The inferior larynx, which is situated at the bottom of the trachea, is formed by several of the lowest rings of the windpipe. This lower larynx varies exceedingly both in form and structure, and is, with few exceptions, as in the case of some vultures, always present. The larynx has special muscles, by which the distance between the vocal cords may be increased or diminished. Singing birds have five pair of these muscles, and possess at the inner edges of each compartment of the larynx an additional membraneous fold, the semi-lunar membrane, as it was called by Savart, which is of considerable size in birds which can be taught to speak. Some who have but little power of modulation, as birds of prey, have only one; others have no special muscle to shorten the trachea, as the *gallinae*. Savart's researches on the vocal organs of birds are very complete.

That the voice of birds is produced in the inferior larynx is amply proved by the fact, that a fowl may be

* See Humboldt's Zool. Observ. I., p. 9..

able to utter cries after the trachea is divided, or even its head cut off.

In *reptiles* and amphibia, the voice is produced in the larynx: but their vocal organs exhibit a considerable difference in structure. Henlé has given a minute description of the anatomy of the various families. In reptiles, the larynx of the mammalia is in an imperfect, or rather rudimentary state, and is chiefly developed in the male. The roar of the alligator and crocodile, and the croaking of the frog, are both produced by the vibration of their vocal cords. Serpents have no vocal cords; and the hissing sounds which they produce are occasioned by the passage of the air through the narrow opening of the glottis.

In the gecko (a nocturnal lizard), which possesses a very capacious voice, the vocal cords are more developed than in the crocodile.

Sounds of Fishes.—Most fishes are dumb. There are, however, some exceptions, as the triglae, pogonias, &c. The former emit, on being taken out of the water, a grunting sound. The pogonias, which have received the name of *tambour*, produce continuous sounds in the water. The hypothesis that the muscle peculiar to the air-bladder, which in these animals is very large, has a share in generating the sound, offers no satisfactory solution; as the *cottus*, which has no air-bladder, also emits a sound on being pressed.

An interesting paper was communicated a few months ago to the Academy of Sciences, by Dr. Dufosse, who has endeavoured to ascertain the nature of such sounds, and that of the organs which produce

them. From the dissection of upwards of two hundred individuals of the ophidium tribe, Dr. Dufosse deduces the fact that the males only are provided with an air bladder capable of producing sounds by the aid of one or two moveable bones; whereas, the female, although possessing an air bladder like the other sex, has neither bones nor muscles calculated to press or act on it so as to cause the emission of any voluntary sound. This anatomical difference leads to the conclusion that there exists an acoustic communication between the individuals of the two sexes, and that, perhaps, fishermen may derive advantage from this circumstance, in the way that birdcatchers do. Dr. Dufosse, however, establishes a distinction between voluntary and involuntary sounds; thus, if a tolerably sized fish be taken out of water and left to die, it will emit certain irregular and accidental sounds, which are merely the result of the convulsive motions which precede death. The voluntary sounds, on the contrary, are produced in two ways—either by rubbing together the upper and lower bones of the pharynx, or by the play of certain organs expressly for the purpose. If a mackerel, for instance, be seized by one of its fins with a pair of pincers, it will struggle to get away, but emit no sound; if, on the contrary, it be seized with the hand by the lower part of the body, it appears to lose all energy, it ceases to struggle, and emits a moan. If it be taken out of the water and its mouth opened, so as to see the pharynx, it will continue to moan, and it will be distinctly perceived that the sounds are produced by the friction of the bones

of the pharynx; the air bladder may be pierced through with impunity, the moans still continue. This is a voluntary sound of the first kind; Dr. D. does not, for the present, quote any examples of the sounds of the second kind, but leads us to believe that he will soon publish another paper on the subject.

Sounds of Insects.—The sounds produced by a large number of insects were commonly attributed to the motion and vibration of the wings during flight. Burmeister, however, has shown that in many of them, such as bees and flies, the sounds are not solely owing to friction, but are produced by the air passing rapidly through the thoracic air holes. The sound thus produced is called humming, or buzzing, while when caused by friction it is termed stridulation.*

Some insects, as the death watch (*anobium*) produce, by striking hard substances with their mandrils, a sound resembling the tick of a watch. The death-head moth (*sphinx atropos*) emits, on being handled, a plaintive sound. Huber† avers that this moth invades, and plunders with impunity, a hive containing an army of bees, notwithstanding their watchfulness and pugnacity. To account for this phenomenon, he conjectures that this insect possesses, like the queen bee, the faculty of emitting a certain sound which strikes bees motionless, and uses it by acting first on the sentinels at the entrance, and then on the bees within. The same

* Goureau (Essai sur la Stridulation des Insectes) remarks that those insects which generate sound by friction are musicians and not singers, and that insects make use of their voices to communicate certain sensations.

† Observations on the Natural History of Bees.

author also relates that he witnessed the introduction of a strange queen into a hive. The bees at first appeared much excited, and began to bite and pull her, until she emitted a certain sound, when *the bees all hung down their heads* and remained motionless.

Dr. Bevan (*On the Honey Bee*) throws some doubt on Huber's statement, but he admits that when the queen bee pipes, prior to the issue of an after-swarm, the bees that are near her remain still, with a slight inclination of their heads, but whether the royal voice impresses the bees with fear or veneration, he will not undertake to decide.

Some insects, as the male *cicadæ* of Brazil, can, by certain organs, which are situated internally, produce sounds which are audible at a considerable distance. The essential part of the sound producing organs seems to be a tense membrane stretched across a cavity in the last segment of the thorax on either side, acted upon by opposing bundles of muscular fibres. Other external plates increase the sound by resonance; "and so effectually do they act," says Dr. Carpenter, "that a certain *cicada* of Brazil is said to be audible at the distance of a mile, which is, as if a man of ordinary stature possessed a voice that could be heard all over the world.

That all these diversified sounds serve the purpose of mutual communication, can scarcely be doubted by any person who has observed, how admirably in nature the means are always adapted to the end proposed.

CHAPTER VIII.

ON LANGUAGE IN GENERAL.

Language in its widest sense signifies a mode of expressing to other beings certain internal sensations, emotions, and ideas.

As this may be effected either by addressing the ear or the eye, language admits of a division into *visible* and *audible* language. Visible language includes all modes of communication by signals, pictures, letters, fingers, flowers, gestures, &c., and in this sense we speak of the language of flowers, of the eyes, &c.

Audible language includes the expression of the feelings both by articulate and inarticulate sounds, and may be distinguished as natural and artificial language.

Natural Language.

Most animals, it has been seen, possess in a greater or lesser degree the power of making known their sensations by means of inarticulate sounds or *cries*.

The CRY may therefore be considered as the universal language of the animal creation. It is purely instinctive, being independent of all experience; it differs in every species, and evidently belongs to the specific organization.

This natural language of animals is probably more extensive than is generally admitted. The vocabulary of the common cock and hen is, by Dr. Mason Good, considered richer than that of the other tribes of birds, probably because we are better acquainted with it. Certain it is that the cock has a different cry for announcing the morning, for his love-speech, and for his shout of victory; while the cries of the hen, after laying, differ from that when the brood is hatched; and both are unlike to cries emitted by her when her progeny are in danger.

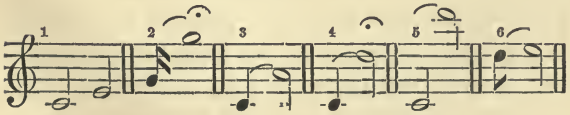
Dupont, a French author, who has spent many years in studying the languages of animals, asserted that he understood 12 words (if so they may be called) of the vocabulary of pigeons; 12 of that of common fowls; 22 words of cattle language; 13 of dog language; 14 of cat language; while he believed that he completely understood the language of rooks.

The Human Cry.—The mechanism of the vocal apparatus in the formation of the cry is not essentially different from the ordinary phonetic process. It is almost entirely produced in the larynx, and consists in man chiefly of vowel sounds, requiring little assistance from the organs of articulation. The human cry appears to consist of a rapid transition from the notes of the chest-voice into the falsetto, the chest-note being usually of short, and the falsetto of longer dura-

tion. The production of acute sounds in the cry are the result of a stronger impulse of the expired air, combined with a greater tension of the vocal cords.

The cry is, perhaps, the first mental manifestation of the new-born child, by which it gives expression to its feelings and wants; and by its agency, man might, like the lower animals, establish—on a very limited scale, no doubt—relations with his fellow beings. Every emotion has its appropriate vocal expression. The cries of admiration, joy, and grief—the scream of terror, the shout of victory, &c., are perfectly distinct, differing in pitch, loudness, and duration. Without going so far as Colombat, who has attempted a notation of the cries arising from various pains, so that he was able to distinguish between the cries resulting from the application of the knife, the actual cautery and other operations, it is certain that the cry of pain is not uniformly the same; and that an experienced physician is frequently able to judge, from the peculiarity of the cry, of the nature and seat of the disease. Broussais observed that every suffering organ has its peculiar cry.

Colombat's Notation of Various Cries.



No. 1. Expresses the cry caused by the application of the actual cautery, or from burning.
No. 2. The cry from the application of the knife in surgical operations.
No. 3. The cry proceeding from violent emotion.
No. 4. The cry caused by sudden danger.
No. 5. The cry in parturition.
No. 6. The cry of joy.

Artificial or Articulate Language.

By articulation, with regard to speech, is, in a general sense, understood the modification which the vocal sounds undergo by means of the organs placed *above* the larynx, including the lips, the teeth, the nose, &c.

That the faculty of speech does not entirely depend on the state of the organ of hearing and vocal apparatus is rendered manifest from the fact that many idiots are incapable of speech, notwithstanding that their organs of speech are well developed and capable of performing their function. Speech, therefore, includes articulation, but articulation does not necessarily include speech. Moreover, several species of animals, birds especially, possess, as will be presently shown, not merely great vocal, but well developed articulating powers.

The vocal powers of the mocking bird, *Turdus polyglottus*, (Lin.) are so marvellous that we can scarcely credit them; but that all who have seen and heard them describe them nearly alike. Wilson says of him, that a bystander destitute of sight would suppose that the whole feathered tribe had assembled together on a trial of skill, so perfect are his imitations. He many times deceives the sportsmen, and even birds themselves are frequently imposed on by this admirable mimic. In confinement he somewhat loses in power and energy, and his song, though still very beautiful, falls, according to Audubon, far short of his "wood-notes wild." The same author says that his imitative powers are amazing,

as he mimics with ease all his brethren of the forest and the water, as well as quadrupeds; he never met with an instance of one who imitated the human voice, although he had heard that this bird possessed that power.

Talking Parrots.—The ash-coloured or grey parrot, *Psittacus erythacus*, is, if not conspicuous for brilliancy of its plumage, distinguished above the rest by its docility and powers of mimicry and distinctness of articulation. Large sums have been given for peculiarly talented individuals of this tribe. A parrot purchased in 1500 by a cardinal, for 100 gold pieces, could repeat the whole of the apostles' creed. Various anecdotes of this bird are related in Willoughby's work on ornithology, and the high prices mentioned at which some celebrated parrots were bought.

Parrots, like some other birds, live to a great age. Le Vaillant mentions one that had lived in a family ninety-three years, at which time it was in a state of decrepitude. When young, it had been distinguished for its colloquial powers and distinct articulation. It was also so docile that it fetched, when called upon, its master's slippers, called the servants, &c. Its memory began to fail at sixty, when it lost the power of acquiring new words, and began to speak at random, intermixing in an irregular manner old and new phrases.

Colonel O'Kelly's parrot, which he had purchased for one hundred gnineas, possessed the most extraordinary imitative talent. This bird could sing a number of songs in perfect time and tune. It would beat time while it whistled, and if it mistook a note, it would revert to the bar where the mistake occurred,

and finish the tune with great accuracy. The parrot not only repeated a great number of sentences, and answered questions, but expressed her wants articulately, and gave her orders apparently in a rational manner.

"There is a legend," says Baron Humboldt,* "amongst the Guareke Indians, that the brave Atures, when closely pursued by the cannibal Caribs, took refuge in the rocks of the cataracts—a mournful place of abode in which this oppressed race perished, together with their language. There still lives, and it is a singular fact, an old parrot in *Maypures*, which cannot be understood, because, as the natives assert, it speaks the language of the Atures."

The parrot of Atures, has been made the subject of a poem, by Professor Ernst Curtius. The following stanzas, are from Mr. Edgar Bowring's elegant translation of this charming composition.

THE PARROT OF ATURES.

Where, through deserts wild and dreary,
Orinoco dashes on,
Sits a parrot old and weary,
Like a sculptured thing of stone.

* * * *

Where yon billows wild are breaking,
Sleeps a tribe for evermore,
Who, their native land forsaking,
Refuge sought on this lone shore.

* Views of nature by Alex. V. Humboldt, translated and ublished by Bohn.

As they lived, free, dauntless ever,
So the brave Aturians died;
And the green banks of the river
All their mortal relics hide.
* * * *
All, alas! are lifeless lying,
Stretched upon the grassy bed;
Nor can all his mournful crying,
E'er awake the slumbering dead.

Still he calls with voice imploring,
To a world that heeds him not;
Nought replies but waters roaring—
No kind soul bewails his lot.

Swift the savage turns his rudder,
When his eyes the bird behold;
None e'er saw without a shudder,
That Aturian parrot old.

There are but few well authenticated cases on record, with regard to the articulating capacity possessed by other animals.

The *speaking dog*, described by Leibnitz, could pronounce the whole alphabet, excepting the letters m, n, and x. In the History of the French Academy of Sciences (1715), to which Leibnitz communicated this interesting phenomenon, may be found the following passage:—

"We learn that there exists at this moment at Zeitz, in Saxony, a dog which can speak; a fact we should not venture to announce, without such an authority as Leibnitz. The dog, a common mastiff, once produced, in the hearing of a boy, certain sounds, resembling German words, which induced the boy to give him

further instructions. The teacher, who it appears had very little else to do, spared neither time nor trouble, and as the pupil was evidently talented, the progress was so satisfactory, that after some years he could pronounce about thirty words, including some foreign, such as thé, café, chocolat, assembleé. It is necessary to observe that the dog, when he went first to school, was already three years old, and it must be added that he only repeats the words after his master, and *not spontaneously.*" The same story is related in the *Acta Eruditorum.* Another speaking dog, at Berlin, mentioned in the *Breslauer Sammlungen*, 1719, and *Bibliotheque Germanique*, 1720, could pronounce sixty words, but none containing more than three syllables. In 1718 an Austrian exhibited a dog in Holland which could pronounce all letters except l, n, m.

It certainly cannot, as already observed, be denied that in a state of nature the voices and intonations of animals are significative, and convey intelligence to each other. It may also be admitted that animals are not altogether ignorant of the meaning of the words addressed to them, but it would be going too far to say that animals speak in the real sense of the word. Speech is audible thought; the thought must precede and generate the word. Many of the marvellous stories recorded of parrots, which are said to have given rational answers to questions, were evidently the result either of chance, or of what they had been taught to repeat by rote.

CHAPTER IX.

VENTRILOQUISM

AND

SPEAKING MACHINES.

In treating of the timbre, it was stated that this natural quality of the voice may, by altering the condition of the vocal tube, be considerably modified; hence some persons are able to imitate, not merely the timbre of voices very different from their own, but also the timbre of various instruments. This factitious voice has received the name of *ventriloquism* or *engastrimism* —designations which might with great propriety be discarded, as they only tend to perpetuate erroneous ideas. The word *polyphonism*, which has been proposed as a substitute for ventriloquism is much less objectionable.

The Latin *ventriloquus*, and the Greek *engastrimuthos* (in-belly-speech) were designations given to persons whose voices appeared to proceed from and to be

articulated in the stomach or belly. Hippocrates mentions it in his fifth book on epidemics as a disease. The *engastrimuthoi* of the Greeks were diviners who delivered oracles without moving the mouth and the features, so that it appeared that some demon of which they were possessed, had spoken within their body. To this class may have belonged the pythonesses or priestesses of Apollo. Divining by a familiar spirit seems to have been early prevalent among the Jews, as it is expressly forbidden in the scriptures. Many theologians are of opinion that the witch of Endor* was only a clever ventriloquist. The Christians, although they made less use of ventriloquism than the pagan priests, did not entirely abandon the practice.

The persons gifted with this power were alternately looked upon as inspired beings, whose mission it was to reveal God's word, and at another time they were considered as the children of Satan, and according as either opinion prevailed, they were either venerated or burnt.

Bordeu, a learned critic, of the sixteenth century, gives a detailed description of a ventriloquial illusion practised by Louis Brabant, valet-de-chambre of Francis the First. Having been denied the hand of his lady-love by her father, Brabant tried, soon after the father's death, to obtain the assent of his widow by the aid of ventriloquism. He consequently entered her house, when the widow heard the well-known voice of her

* Archbishop Eustache says in a treatise on the subject that the speech of this witch proceeded from the least noble part of her person.

departed husband exclaiming "Give my daughter to Louis Brabant. I am suffering severely in purgatory because I opposed the marriage. If you do what I recommend, I shall ascend to heaven."

The widow immediately consented, and the marriage took place. The same Louis Brabant obtained, by similar means, from a rich unscrupulous banker named Cornu, 10,000 crowns for the purpose of purchasing the freedom of Christian slaves. It appears from the narrative, that the first attempts to frighten the banker out of his money were partial failures, and it was not until all the saints of the calendar were invoked, overwhelming with their tumult the reluctant miser, that he parted with his money.

The Abbé de la Chapelle must be considered as one of the first authors who threw some light on the subject. In his work (*le Ventriloque, ou l'engastrimyth*, published 1772), the abbé gives a description of the freaks of St. Gilles, a grocer, at St. Germain-en-Laye, and of a certain Baron Mengen, of Vienna. The Royal Academy of Sciences considered the subject sufficiently interesting to send MM. Leroy and Fouchy, as commissioners, to St. Germain; and the grocer not only displayed before them all his feats, but imparted to them, in the most candid manner, all the secrets of his art, showing that he possessed a great power of imitating all kinds of sounds, and to modify them in such a manner that they appeared to come from other places than from his mouth. Baron Mengen also confessed that, in early life, he had a passion for imitating the voices of persons and the cries of animals; he, like St. Gilles, attributed

his art altogether to mimicry, and to his power of managing the breath, by respiring as seldom as possible.

St. Gilles's art must have been of no common order, as by means of it he succeeded in converting a celebrated abbé, who was a great pluralist and a sordid miser, to renounce the vanities of this world, and to do penance for the rest of his life. It is scarcely necessary to state that this imitative voice, which is now used only for amusement, is not produced in the belly; nor has the ventriloquist, as some writers thought, a double or a triple larynx.

The art of the ventriloquist consists, in the first place, in the ability of imitating many sounds accurately, so as to counterfeit the cries of animals and the voices of persons. The essential quality requisite in ventriloquism, is the capacity of the performer skilfully to create illusions, as regards the direction and the distance whence the sounds proceed. Sound, as has already been intimated (p. 59), seems to be subject to the same law as light; that it diminishes in force in proportion to the square of the distance. The intensity of familiar sounds from certain distances being known to us by experience, we judge of the distance of the sound by its loudness or faintness. The ventriloquist generally preserves the timbre and pitch of the voice he imitates, but by skilfully graduating the intensity of the sound, either by increasing or reducing its loudness, he contrives to create in the mind of the listener the idea of an increasing or decreasing distance of the source whence the sound proceeds. The same effect is obtained on the stage—the music of an approaching

army, faint at first, but gradually increasing in intensity, produces in the audience the illusion that the band comes from a considerable distance.

The direction whence a sound proceeds is much more difficult to be judged of, and, under certain circumstances, as all sportsmen know, it is almost impossible to arrive at any certainty respecting it. The ventriloquist, therefore, in most cases, by looking or listening in certain directions, himself suggests to the minds of the audience where the sound proceeds from. If the ventriloquist, in addition, is capable of producing variations in loudness, by rapid transitions from the chest to the falsetto notes, the illusions are more perfect.

It appears, therefore, that the pretensions of some ventriloquists that they possess a peculiarly constructed vocal apparatus, or that the faculty is a gift of nature, has no foundation in fact. The mechanism chiefly consists of a deep inspiration, by which the lungs are filled with a large mass of air, which is gradually and slowly expired during articulation. To well manage the breath, and to respire as rarely as possible, is an essential requisite of the art. Owing to the slow expiration the process is fatiguing, and many ventriloquists are frequently heard to cough during the performance.

Every one must have observed that common ventriloquists rarely show their front face, which is usually turned away from the audience. Great artists, however, possess the power of producing all effects without any apparent movement of their features, and look the audience in the face. When it is considered that we all

can speak and sing with the jaws closed, without much disturbing the facial muscles, it is not astonishing that the practised ventriloquist, who, in showing his face, avoids the labials p, m, b, as much as possible, or produces them with the least apparent motion, should be successful in deceiving his audience.

Every person can, by practising, acquire the art; his progress in it, however, will depend on the compass of his voice, on the degree of flexibility of the trachea, especially of the cartilages of the larynx, and on the nervous susceptibility of their muscles.

Finally, it may be stated that the opinon enunciated by Amman, Haller, Segond, and other celebrated physiologists, that ventriloquists chiefly articulate during *in*spiration is proved to be erroneous. Now and then they may, in order to produce a change in the timbre and the enunciation, avail themselves of the inspiratory voice, but this is the exception and not the rule. The voice in ventriloquy is, like the natural voice, formed in the larynx during *expiration*, and is modified in the throat and fauces by means of their respective muscular apparatus, over which the ventriloquist has, by constant practice, acquired perfect control.

Speaking Machines.

That the ancients were more advanced in mechanical philosophy than we give them credit for, is sufficiently proved by the ingenious contrivances which their priests invented to delude the people. They had their

speaking or singing statues, representing the gods, uttering oracular responses. The speaking head of Orpheus, in the island of Lesbos, was celebrated, not only in Greece, but even in Persia. There is but little doubt that the answers were conveyed to it by the priests, through pipes, as may have been the case with the tripod at Delphi.

A similar deception was, according to Reitz,* practised on King Charles II. by an Englishman, Thomas Irson, who exhibited a wooden head which answered questions whispered into its ear. The astonishment of the king vanished on its being discovered by a page, that a priest in an adjoining room answered through a pipe, which opened in the mouth of the figure.

These machines were generally so contrived that an assistant was required, who was generally concealed in an adjacent apartment. Some figures, however, were sufficiently large to contain, within a box, a child or a woman. The most ingenious mechanism of this kind, exhibited about forty years ago, went by the name of the *Invisible Girl.* This machine consisted mainly of a hollow copper ball, about a foot in diameter, suspended from wires. Into the ball were fixed the extremities of four trumpets. A spectator proposed a question by speaking into one of these trumpets, when immediately an answer was returned, in a weak voice, from all the trumpets. The actual speaker was a full grown woman in a neighbouring apartment, who was able, through a

* See Beckmann's History of Inventions, translated by Johnston.

small hole to see what was going on in the exhibition room, and conveyed her answer through a tube, which passed beneath the floor. Whether the speaking head of brass, said to have been constructed by Gerbert, afterwards Pope Sylvester II., A.D. 1003, was upon a similar principle, is not known. The *androides*, constructed by Albertus Magnus, in the thirteenth century, is said not only to have moved, but spoken. Many stories are told of this machine, which so terrified Thomas Aquinas, the celebrated pupil of Albertus, that he broke it in pieces; upon which the philosopher exclaimed "*Periit opus triginta annorum.*"

If it be true, as implied in the above exclamation, that it was the work of thirty years, it must have been very complex; and it is not at all impossible that, from Albert's knowledge of mechanics, the machine, by means of the air, and imitation of the vocal apparatus, produced sounds resembling those of the human voice.

One of the most celebrated automata, which produced musical sounds, was exhibited by Vaucanson, at Paris, in 1738, when a particular account of it was published and approved by the Academy of Sciences.* The figure was about $5\frac{1}{2}$ feet high, and represented a flute player, which was capable of performing twelve tunes by wind issuing from its mouth into a German flute, the holes of which it shut and opened with its fingers. Besides another figure, which played on the shepherd's pipe, and beat a drum with the right hand, he exhibited a duck of the natural size, which moved its wings,

* Le Méchanisme du Fluteur Automate, par Vaucanson. Paris, 1738. Vaucanson died in Paris, in 1782.

quacked like a duck, ate corn and drank water, and, after some time, dropped something resembling the excrement of a duck. In the cathedral of Strasburgh, may be seen a cock, which flaps its wings, and crows three times every time the clock, with which it is connected, strikes twelve.

Professor Beckmann, whose "History of Inventions," published in 1782, has afforded abundant materials to all subsequent writers on the progress of mechanical arts, speaks in disparaging terms of the speaking machines of his time, which he describes as follows :—

"The figure, or only a head, is often placed upon a box, the forepart of which, for the better *deception*, is fitted with a pair of bellows, a sounding board, cylinder, and pipes, supposed to represent the organs of speech. At other times the machine is only like a wig maker's block, hung round with a Turkish dress, furnished with a pair of arms, and placed before a table, and sometimes the puppet stands upon the table, or against the wall. The sounds are heard through a speaking trumpet, which the figure holds in its mouth. Some affirm that the voice issues from the machine, others that the juggler answers himself, by speaking as a ventriloquist; and some believe that the answers are given by a man somewhere concealed. The violence with which these opinions are maintained, exposes the juggler often to the danger of *losing his life;* for when the illusion is detected, the populace, who in fact suffer themselves willingly to be deceived, and who even pay the juggler for his deception, imagine that they have a right to avenge themselves for being imposed upon. At present

this art is well understood. Either a child or a woman is concealed in the juggler's box, or some person, placed in a neighbouring apartment, speaks into the end of a pipe, which proceeds through the walls to the puppet."

This description seems perfectly applicable to the machines which were then exhibiting, for it was not until 1780 that successful attempts were made to produce what may be called legitimately articulating automata.

It appears that the Academy of Sciences of St. Petersburgh offered a prize for the best essay on the nature of the vocal sounds, which prize was gained by M. Kratzenstein,* who proved that all vowels could be produced by reed tubes of peculiar forms. Wolfgang von Kempelen, a celebrated mechanician of Vienna, whose chess-playing automaton created a great sensation, was engaged in these researches at the same time. Kempelen employed conical tubes with a reed at its upper narrow extremity. After some years labour he contrived to produce from his apparatus some words and sentences.

Both Kratzenstein and Kempelen published the results of their experiments ;† Kempelen's treatise contains many original thoughts and illustrations. In one of his earliest experiments performed with a machine, resembling a wine glass, the handle of which was perforated and provided with a reed, Kempelen obtained vowels by covering its mouth with his left

* Tentamen coronatum de voce, Petrop. 1780.

† The essay of Kratzenstein presented to the Academy of St. Petersburg appeared in the Journal de Physique, vol 21. Kempelen's treatise "Le Mecanisme de la parole, &c." was published at Vienna, 1791.

hand. "I began," he says, "by obtaining several vowels in proportion as I covered the opening more or less with my left hand. But I could not obtain them except I changed the positions of my hand and fingers in rapid succession. If I retained my hand in any one position for any length of time, I seemed to hear nothing but A. I was not slow in deducing from this, that the sounds of speech are only rendered distinct by the relation existing between them, and do not become perfectly clear until they are connected into entire words."

In Kempelen's machine the sound was produced by an ivory reed, covered on the side, which vibrated against the edges of the aperture with very thin leather. The reed was placed between the wind-chest and a narrow part of an india-rubber funnel.

Kempelen says of his machine, that it readily pronounced French or Italian words; but long German words, on account of the consonants which so frequently occur in them, gave him much trouble, and rarely succeeded well. The machine could produce but few entire phrases, as the bellows were not sufficiently large to furnish the requisite quantity of wind.

At the very time when Kratzenstein and Kempelen constructed their machines, Abbé Mical, a skilful mechanician, exhibited in 1783, to the French Academy of Sciences, two colossal brazen heads which uttered words and entire sentences. According to Rivarol's description, Mical had applied to one head a set of keys, which were acted upon by pins fixed on a cylinder, so that a number of phrases were produced as tunes are upon a barrel organ. To the other head was attached

a key-board like that of a piano, the keys corresponding to the different sounds and tones of the French language, reduced by the inventor to a small number.

In the report given to the Academy by Vicq d'Azyr it does not appear that the machine was much superior to that of Kempelen, which was exhibited in Paris at the same time.

The inventor, disappointed in his expectations, broke them to pieces, and died shortly after.

On verifying Kempelen's experiments, Willis* found that by making the bell shallower, and covering it by a piece of wood, instead of the hand, he could produce all the five vowels placed in this order u, o, a, e, i. The success of the attempt induced him to try the effect of cylindrical tubes of different length, and he found that by forcing a current of air upon a reed in a pipe, the vowels are as the tube is lengthened or shortened produced, not as they are usually placed, a, e, i, o, u, but in the following order, i, e, a, o, u, which succession is manifested in the mi-e-a-o-u-ing of a cat.

The most ingenious machine of this kind, a remarkable result of preservance and contriving skill, was exhibited about twelve years ago, by the inventor, Mr. Joseph Faber, of Vienna, in the Egyptian Hall, London.

The name which Mr. Faber gave to it was Euphonia, and it certainly imitated in a more perfect manner than any hitherto produced, the human voice and language in speaking and whispering, as well as singing.

The machine to which there was attached an arti-

* On the vowel sounds, and on reed organ pipes, Transactions of the Cambridge Philosophical Society, vol 3, 1829.

ficial head and bust, resembled a small chamber organ, from which it was distinguished by having only one tube, through which the air was forced into the artificial larynx, from a wind-bag under the control of the foot. Thus by means of bellows, pedal, and keys, which the professor played like the keys of a piano, the automaton was prompted to speak or to sing.

The mouth of the automaton had the exact dimensions of the human organ, and could by a peculiar mechanism, be brought into any position requisite for the production of articulate sounds. A wind-bag represented the lungs, which forced the air through an elastic tube, into the artificial larynx. In this organ the sound was, as in the living body, produced by the vibrations of elastic lamellae, from which the sounding air-current passed into the cavity, containing the tongue, lips, and gums. The upper jaw was fixed, the lower moveable. The internal surface was covered with india-rubber; and the nasal canal consisted of the same material. By closing or opening this canal, its influence upon the production of certain letters, such as m, n, ng, could be plainly perceived. Sixteen keys governed the requisite movements. For the production of many letters several keys had to be struck simultaneously. The closure of the nasal cavity by an artificial velum, and the shortening and tension of the vocal cords, were produced by a separate mechanism.

Fourteen of the keys produced, severally, the following sounds: a, o, u, e, i,* l, r, f, w, s, sch, b, d, g,

* As pronounced in the continental, especially the German and Italian languages.

(or p, t, k). One key produced by changing the shape of the glottis, the aspirates h, ch. Another key, by opening the nasal tube and permitting the air partially to pass through it, changed b (p) into m; d (t) into n; and g (k) into m, ng.*

To produce ä, ö, ü, as pronounced in the French words *père*, *peu*, *sure*, a and e, o and e, u and e, were struck simultaneously. Similar sounds were produced on striking at the same time, a and i, o and i, u and i. To produce the diphthongs au, äu, eu, ai, ei, oi, ui, the respective keys were struck in rapid succession.

The intensity of the sounds, the hardness and softness of the consonants, and the accents of the syllables were all the results of a corresponding stronger or weaker pressure upon the bellows, and of a rapid or slow touch of the keys. A moderate change of the pitch was effected by the same means. To produce, however the

* It is not a little singular that about six years before Mr. Faber exhibited his machine, there appeared in the London and Westminster Review an article, generally attributed to Professor Wheatstone, containing the following remarks.

"The positions of the organs for the three sounds, m, n, ng, are exactly the same as for b, d, g, only in the former, the soft palate is depressed, so as to allow the voice to escape through the nostrils; by this the articulation is rendered continuous. If on a speaking machine, therefore, these three sounds were perfect, the addition of a single key would convert them into six elementary sounds. To imitate all the usual articulations of speech, a machine would not require such complicated motions as might at first be supposed. The difficulty in the construction of such a machine is reduced to the perfect mutation of eleven sounds and the vowels."

Faber's machine as will be seen, had just sixteen keys, including those for the vowels. It may here also be stated that a speaking machine, made by Prof. Wheatstone, from Kempelen's description, with some improvements, is or was in the collection of Philosophical Instruments of King's College, London.

high notes of a soprano, or the low notes of the bass, the glottis was either narrowed or rendered wider by a separate contrivance. When the glottis was widely opened, the voice was reduced to a mere whisper, while when the operator dwelt long upon a key of a vowel sound the automaton sang.

Although chiefly calculated for the Teutonic tongues, the machine could be made to speak in all languages; it was, however, not easily handled, and required the constant attention of the inventor.

This remarkable work, a singular combination of inductive reasoning and mechanical skill, the result of seventeen years of hard work, appears to have shared the same fate as Mical's speaking heads; for it was destroyed by the inventor in a paroxysm of passion, owing to his having met with but little encouragement in America, where he had hoped to secure for himself an independence.

CHAPTER X.

GENERAL SURVEY

OF THE

ELEMENTS OF SPEECH.

THE production of the voice in general, as has been shown in a preceding chapter, is the result of certain actions in the larynx, by which the air is made to vibrate, and in its turn puts the vocal ligaments into a state of vibration. The voice thus produced, which may be considered as the raw material, is again, by the action of the throat, the palate, the lips and the teeth, modified and moulded into articulate sounds—the elements of speech.

These articulate sounds are visibly represented by certain marks, lines, or characters, called the letters of the alphabet, which will be treated of separately in a subsequent chapter. For the present it may be sufficient to state that in speaking of the sound of a letter, it is merely intended to designate thereby a certain modification, which the letter in qnestion represents.

Articulate Sounds.

Articulate, or speech-sounds, are commonly divided into two classes—*vowels and consonants*, possessing the following characteristic distinctions:—The vowels or vocal sounds formed in the larynx, are considered as simple modifications of the voice—the effect of the altered shape of the buccal cavity—and pass out without meeting with any material interruption; while the consonants are produced by the stoppage of the sounding air-current in some part above the larynx.

These different vowels are, according to Kempelen, the result of differences in size of the oral canal—the space between the tongue and palate—and the oral openings. The dimensions of these parts in the production of the different vowels pronounced long are as follows:—

	Size of oral opening.	Size of oral canal.
a (as in bar)	5	3
e (as in prey)	4	2
i (as in marine)	3	1
o (as in old)	2	4
u (as in lute)	1	5

From these dimensions it would appear that the aperture of the lips (the oral opening) is smallest in the pronunciation of *u*, and gradually increases in pronouncing successively *o*, *i*, *e*, *a*; while the aperture of the oral canal (the throat), is smallest in the pronunciation of *i*, gradually enlarging in pronouncing *e*, *a*, *o*, *u*.

The correctness of these measurements, especially in relation to the formation of *a* and *e*, has been questioned

by Professor Purkinjé. The production of these vowels depends chiefly on the cavity of the throat, between the tongue and the larynx; in both cases this space is large, but largest in the pronunciation of *e*. It appears, however, to the author, not a little remarkable that Purkinjé, Kempelen, and most writers, physiologists, as well as grammarians, consider the action of the lips quite as essential to the formation of the vowels as that of the throat. Such is evidently not the case, for all the vowels can be pronounced distinctly, though, perhaps, not with the same precision—the oral opening remaining the same, and the lips unconcerned.

The Vowels.—The number and the sounds of vowels vary in different languages. In some of them, as in the Italian, German, and Spanish, the sounds of the vowels *a*, *e*, *i*, *o*, *u*, are generally uniform, except as they are pronounced short or long. In English, on the contrary, the same characters are made to represent a variety of intermediate sounds, greatly tending to perplex both foreigners and natives, and offering considerable difficulties in the acquisition of English orthography and orthöepy. It is therefore necessary to impress upon the reader, that the subsequent remarks on the vowels refer chiefly to the sounds which they possess in most of the continental languages, viz:—

a short as in bat; long as in bath.
e short as in pet; long as in prey.
i short as in sin; long as in marine.
o short as in on; long as in bone.
u short as in bull; long as in rule.

The short vowels are considered as the simple original elements, which produce the long vowel. "If," says Grimm,* "the complete short vowel = 1, the long vowel would be = 1 + 1 = 2."

Kudelka† states, that experimenting on the production of the vowel sounds he found, that on placing the palm of the hand lightly upon the mouth and suddenly withdrawing it while enunciating either *o*, *u*, or *e*, the sound *o* is changed into *a*, *u* into *o*, and *e* into *i*. This experiment, which every person can easily verify, succeeds in most cases. It is, however, just possible, that what has been called the expectant *attention*, namely that state of mind, when it is engrossed with the idea that a certain action will occur—may have a considerable share in the production of the effect, if it be not the sole cause of it.

Vowel System.

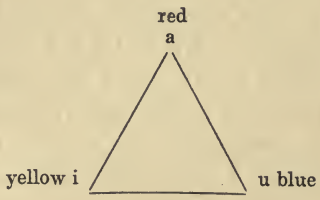
There are but three pure or original vowels, viz — *a*, *i*, and *u*; the first representing the guttural, the second the palatal, and the third the labial vowel sound.

These three vowels were, even in the most ancient languages, sufficiently distinct to be marked in writing. It must not, however, from this remark, be concluded, that man, in a primitive state, uses no other vowels until he requires them by his growing wants.

* Deutsche Grammatik.
† Analyse der Laute, Lintz.

These primary vowels resemble the three primary colours; and by their proper combination all other vowels may be formed, as will appear from the following ingenious schemes of Professor Lepsius.*

The original vowels are here represented by the analogy of a triangle:—



Next to the primary vowels are formed the intermediate vowels, viz., *e* between *a* and *i*, *o* between *a* and *u*, the sound of the German ü (French *u*) between *i* and *u*, and that of the German ö (Freneh eu) between *e* and *o*, as represented in the following pyramids:—

		a		red.
	e	ö	o	orange, brown, violet.
i		ü	u	yellow, green, blue.

The distance between *a* and *i* and that between *a* and *u* being greater than that between *i* and *u*, the intermediate *e* and *o* were again divided each into two

* Exposition of a standard alphabet, by Professor Lepsius, of Berlin.

vowels, one of which was nearer to *a* and the other nearer to *i* or *u*, as follows:—

a

French è French eu. ò Italian.

French é. Germ. ö. au French.

i. Germ. ü. u.

The broken sounds of *a*, *o*, *u*, as in the German *Väter*, *Mütter*, *Söhne*, the plural of *Vater*, *Mutter*, *Sohn*, and in the French père, peu, sure, are avoided in English, as being too troublesome properly to enunciate. Other shades are found in various languages, but the above are the principal vowel sounds existing in the European languages.

Compound Vowels.—Just as two different musical notes, which are sounded at once and in *unison*, produce a joint effect, so may, by the proper combination of two vowels, be produced a more or less perfect blended vowel, which has received the name of a diphthong. Triphthongs and tetraphthongs, consisting of three or four elements, may be formed by prefixing or adjoining other suitable vowels.

As, according to most grammarians, the two vowels forming a diphthong are always short, and as two short vowels are equivalent to a long one, the diphthong is equivalent to a long vowel. It may also be stated that whilst the simple vowel sounds are capable of being prolonged during a certain time, such is not the case with the real diphthongs, in which both the vowels must be

pronounced, though the sound is so blended that it forms only one syllable. In several languages, but especially in the English, many literal diphthongs represent simple vowel sounds, as *ie* in chief, *ei* in receive, *ea* in heart, *ea* in ready, *ea* in neat; while simple letters represent true dipthongs. Thus *i* in mine consists of *a i* pronounced in rapid succession.

As *a* represents the guttural vowel, Professor Max Müller observes justly,* that real compound vowels can only be formed with this sound, when it passes from the throat to the mouth, and carries along with it the palatal or labial pure vowels *i* or *u; a* thus forms the base of the dipthong. If the dipthong be formed of $i + a$ instead of $a + i$ as in fair, or $u + a$ instead of $a + u$ as in laud, the sounds will not be blended, if pronounced in succession, but become *ya* and *wa*, because the intonation of the *a* lies behind that of *i* and *u*, the vocal flatus has to be inverted, which inversion causes a sufficient stoppage to change the vowels into liquids.

The mute e. This vocal sound has given a vast deal of trouble both to grammarians and physiologists. It exists in all languages, it appears everewhere and anywhere; it intervenes imperceptibly between two consonants, when its use is most apparent in those languages in which many words have several consonants together. The sound comes next to ö, but it is capable of assuming various shades, approaching

* The languages of the seat of war.

sometimes *a i* or *u*, as in the words work, bird; it is inherent in the continuous consonants as *l n r m*. There hangs such a mystery about the sound, that it goes by many *aliases*. Rapp calls it the original vowel from which all the other vowels issued and grew. Other scholars call it the unmodified, the least individualised, the obscure, the quiescent vowel. In English and in French, it is simply termed the mute *e*.

But, after all, may not this redoubted vowel be merely a natural means of connecting two articulations, which have but little affinity, or be the dying away sound of an articulation.

This indistinct sound is certainly more or less perceptible in proportion to the affinity of the joined articulations, and according to the time required for changing the position of the respective organs. Thus, in *gr* as in *great*, the obscure sound *e* is but faintly perceptible, as the mechanism of *g* differs not much from that of the guttural *r*. In joining, on the other hand, *p* to *t*, as in *Ptarmigan*, *Ptolemy*, &c., the sound is very perceptible, the mechanism of *p* differing much from that of *t*. These two consonants are therefore rarely pronounced, in English the *p* being usually dropped. Again the mute *e*, or an indistinct sound is heard at the end of words, especially if the last syllable be accentuated, and the final consonant mute, as *p t k;* the reason seems to be that, as the air current is nearly interrupted in articulating the pure mutes, the required expiration is partially restored by the mute *e*. It is doubtful whether the French *e*, as heard in *Londres*, *entendre*, can propery be called a mute *e*.

Consonants.

Consonants (Lat. con-sonantes) sounding with, or at the same time, are usually defined letters, which cannot be pronounced by themselves, but require the aid of vowels. Professor J. Müller* objects to this definition in the following terms:—

"The essential character of vowels is usually considered to be that they are independent sounds, originally formed in the larynx, though modified in the mouth; while consonants are not formed in the larynx, and cannot be sounded perfectly unless conjoined with a vowel. The difference between vowels and consonants is, however, less considerable than this; for all the vowels, as well as the consonants can be produced without a vocal tone, as in whispering; and moreover, one whole class of consonants can be uttered with a vocal sound as well as without this sound."

Dr. Orpen† also observes that it is altogether a mistake to say that a consonant cannot be pronounced without a vowel, for the consonants *p*, *t*, *k*, have no vocal sound at all, and yet can be pronounced with an *s* before or after them, without any vowel; as in *ps*, *ts*, *ks*; *sp*, *st*, *sk*. The truth is, that the possession of a vocal sound is not the characteristic distinction of a vowel, for we can articulate vowels in whispering as well as consonants, though we then use only non-vocal breath, and not vocalised breath, or voice at all.

* Loc cit.
† Pestalozzian Primer.

Granting that both vowels and consonants may be articulated and clearly distinguished in whispering, the questions arise whether it be really an ultimate fact, that in whispering there is a complete absence of vocalisation; or whether it be not more than probable that there is actually a vocalisation, though to a scarcely perceptible degree? Were it demonstrated that the breath is not vocalised at all in whispering, it would only prove that the vibrations of the vocal cords are not essential to furnish the elements of speech, and that the absence of the vocal cords would not deprive man of the means of communicating with his fellow beings.

With regard to Dr. Orpen's observation that the pure mutes *p*, *t*, *k*, can be pronounced with an *s* before or after them without any vowel, it may be remarked that the doctor has not taken into account the influence of the indistinct vowel sound, generally insinuating itself between two consonants, and which, as already stated, may be simply the result of the momentary change in the position of the articulating organs.

It has been seen that in the formation of the vowels, the sounding air current is merely moulded, but not intercepted during its passage through the oral canal, while the production of the consonants is the result of the stoppage which the air-stream experiences in various parts of the buccal cavity.

There are three principal stoppages which occur, either at the throat, the teeth, or the lips, hence consonants are divided into three classes, gutturals, dentals,

and labials, according as they are formed at either of the above places; and are represented by the letters *k*, *t*, *p*.

K represents the pure guttural sound, being formed by the stoppage of the sound from the contact between the soft palate or the root of the tongue and the throat. In the Vaidik Grammars,* the throat is called the place, or the passive; and the root of the tongue, the instrument, or the active organ of the guttural.

T, the pure dental, is formed by the contact between the tip of the tongue and the teeth; the latter are called the place, or the passive; the former the instrument, or the active organ.

P, the pure labial sound, is produced by the contact between the upper and lower lip; the former is called the place, or passive; the lower, the instrument, or active organ.

The consonants are further distinguished into *mutes* or *explosives;* and semi-vowels, or continuous consonants.

k, *t*, *p*, cannot be easily sounded without a vowel; they are therefore called *pure* mutes, and as they are formed by a complete contact between the active and passive organ, which, when it ceases, causes the succeeding vowel to be heard as a burst, they have been called explosives.

To these absolute mutes, *k t p*, correspond the three imperfect mutes, *g*, *d*, *b*.

As in the production of the pure mutes *k*, *t*, *p*, no

* Proposal for a missionary alphabet by Professor Max Müller.

sound is allowed to escape; the voice being stopped abruptly they are also called *tenues*, hard or sharp, while *g*, *d*, *b*, are named *media*, middle or flat, as their sounds are not stopped at once, but may be continued for a short time.

The full pronunciation of an explosive letter requires the closing and opening of the organ, and the complete consonant is best perceived when placed between two vowels, as in *aba*, *ama*. When in a final *m* the mouth is not re-opened, as in *am*, only half of the *m* is pronounced. "It is a decided mistake," says Lepsius,* "to reckon *m* and *n* among the *consonantes continuae;* for in *m* and *n* it is only the vowel element inherent in the first half, which may be continued at pleasure, whilst in all continuous consonants, it is the consonantal element (the friction) which must be continued, as in *f*, *v*, *s*, *z*.

Semi-Vowels.—While in the formation of the pure mutes the emission of sound is stopped for a moment, there are certain letters, as *l*, *m*, *n*, *r*, *f*, which, owing to the comparatively slight contact between the active and the passive organ, allow the sound to be continued after the contact; hence they are frequently called *continuous consonants*, in contra-distinction to the explosives. The usual denomination, however, of these letters, is semi-, or half-vowels, both from their possessing an inherent vowel-element, which can be distinguished in their pronunciation, and also from their resembling the vowels with regard to the protraction

* Lepsius on the Standard Alphabet.

of the sound. *L*, *m*, *n*, *r*, are also called liquids, apparently from their flowing into other sounds.

It is, however, not the case that they can, as is said of the vowel sounds, be protracted at pleasure as long as the breath lasts. Kempelen had already observed, and every one can verify the experiment, that when a vowel is prolonged, it is scarcely possible to distinguish what vowel it is, and this is also the case with the semi-vowels.

Sibilants (hissers), — *s z sh zh* to which other sounds may be added. The sibilants are essentially distinguished from all other consonants both in their formation and their qualities. In their production the contact between the organs concerned is so slight that the sounding current only experiences a friction, but passes outward like the vowels without any stoppage. These consonants are, perhaps, the only ones which admit of being protracted as long as the breath lasts, without losing their distinctive audible characters.

There are many other sounds which can be produced in the human organ, such as the click—a smacking noise when the tongue is suddenly separated from the palate or teeth. There are said to be four clicks in the Hottentot, and only three in Zulu and other African languages. The pronunciation of these sounds only becomes difficult when combined with other sounds. These clicks are frequently produced in European languages, but they are not used as articulate elements of speech, as in the African languages.

The melodious sound of a language is frequently

attributed to a predominating proportion of vowels to the consonants. No doubt a language may become too hard if there be too many consonants in it. It will, however, be found, that the euphony of a language depends rather on the *disposition* of the vowels and consonants than on their relative proportions. Some savage idioms, as the language of the Sandwich islands, exhibit an uncommon proportion of vowels to consonants, yet it can scarcely be said that they are euphonious in the strict sense of the word. Richerand's hypothesis, that the inhabitants of cold countries have been led to use more consonants than vowels, as the pronunciation of the former does not require the same opening of the mouth, and the consequent admission of cold air into the lungs, is, to say the least of it, certainly very far from being satisfactory.

All attempts hitherto made by physiologists to determine the number of sounds which the human organ is capable of producing have necessarily been unsuccessful.* The vowels alone, as has been indicated, flow into each other in imperceptible gradation, and so do the liquids. If to this be added the various combinations and arrangements of which the consonants are capable, man appears to possess an inexhaustible treasury, from which he can at pleasure obtain a new name for every possible notion. Nature, however, is not quite so prodigal with her gifts. Although the spring may be said to be theoretically inexhaustible, practically, man can only, with his vocal organs, pro-

* Kudelka enumerates 121 elementary sounds.

duce a limited number of natural sounds, nor is there any language which uses all possible sounds; but languages and dialects differ from each other both by the number and the predominance of certain classes of sounds which they employ.

CHAPTER XI.

ON THE ORIGIN OF LANGUAGE.

THE broad difference between human speech and the language of the brute creation may be said to consist in this :—That the language of man, being articulated, is capable of being resolved into elementary sounds, words, and sentences, enabling him to give utterance to *distinct ideas and notions*, which the inarticulate cries of animals are evidently incapable of expressing. For this reason, man was, by Homer and Hesiod, called *merops*, a voice-dividing creature.

It appears to be admitted on all sides that articulated language is not like natural language, derived from nature, *i. e.* it is *not instinctive*, but *acquired;* and common observation teaches us that children learn to speak by imitation. But as the human race must have had a beginning in time, the questions arise, whom could the *proto-plasts*, or our first progenitors imitate? and how did they learn to speak? This is evidently, like all the problems which relate to the origin and

destiny of the human species, a question which admits but of two modes of solution—the religious and the philosophical. The religious solution appeals to supernatural intervention, and consequently to revelation, and is generally clothed in a poetical form. The philosophical solution, on the contrary, claims to be the result of reflection and the exercise of the human understanding, and is expressed in the exact language of science.

Plato, Pythagoras, and other pagan philosophers maintained that language was of divine origin. This opinion was embraced by the greater part of Jewish and Christian writers, as it seemed to be supported by the authority of Moses.

The language of the Bible is, however, by no means positive on this point, but seems rather to imply that the origin of language is both human and divine. The Supreme Being did not give names to the creatures, but caused all animals to pass before Adam "To see what *he* would name them." (Gen. ii, 19.) Adam must, therefore, have, already possessed, not only the capacity, but the rudiments of speech, when the opportunity was given to him to exercise his faculties.

Those who, like Monboddo* and his followers, hold the opinion that language was invented by man, give something like the following account of its origin and development:—The first sounds by which men indicated their wants consisted, as they imagined, chiefly of such cries which give expression to the desires, passions, and emotions, accompanied by such gestures and expressions

* On the Origin and Progress of Language. Edinburgh, 1775.

as are instinctively connected with them. In process of time the interjections and cries were articulated. The first articulations were naturally very simple, consisting, probably, only of the three fundamental vowel sounds, and of but few consonants; and as all natural cries are from the throat and larynx, Monboddo thought that the first languages were for the greater part spoken from the throat; that what consonants were used were mostly guttural, and that the organs of the mouth were but little employed.

Speech, as it grew, became more broken by consonants, words were formed and names invented of surrounding and peculiar objects, until at last the multiplicity of words became troublesome, when art interfered and formed a language upon a limited quantity of radical words, according to certain rules.

These theories naturally rest on the supposition that man was, in his primitive state, in a condition approaching brutality, from which he only gradually emerged. But whatever grave objections may, on this account, be urged against these theories and the examples by which they are supported, they are at any rate more satisfactory to the understanding than those mysterious solutions founded upon obscure transcendental speculations.

It may be exceedingly difficult, and all but impossible to trace, step by step, the various causes which have gradually led to the formation of human language; but if it can be deduced from known physiological and psychological data, that the human faculties, limited though they be, are sufficient for the formation of

a language, and if it can be merely shown, not how the various parts of human speech *actually* arose, but how they *might* have arisen, it is sufficient, as Dugald Stewart observes:—"To give a check to that indolent philosophy, which refers to a miracle whatever appearances in the natural or moral world it is unable to explain."

There are at present but few persons capable of passing a judgment in the case, who are disposed to deny that speech is the natural product of the human faculties, varying according to the different circumstances in which they have been developed; and that it is neither the result of the mere material development of the vocal organs, nor of mere arbitrary convention, but the growth of inward necessity and mental progress.

Among the speculations as to the cause which induced men to impose certain names on surrounding objects, the theory, that they were decided in their choice of the articulate sounds employed by a real or fancied resemblance between the sound and the thing denoted, found considerable favour among philologists. Indeed, daily experience shows that children, when they learn to speak, generally designate an object by an imitation of the sound given out by it. It seems thus probable that many, if not all words, were first suggested to mankind by the sounds of the elements, the cries of quadrupeds, the notes of birds, and the noises of insects. This imitation of the natural sounds is called *onomatopoeia* (onoma, name; poieo, I make). All languages contain more or less words which both depict the sonorous body and the sound emitted, and

the Teutonic languages especially, appear to be very rich in this respect.

Alliteration, which is merely a variety of onomatopoeia, consists of the frequent repetition of the same letters, or of syllables of the same sound in one sentence. This imitative harmony, as it has been called, is frequently employed with a happy effect, when the repetition of the same letter concurs with the sonorous imitation, of which the following line, in the *Andromaque* of Racine, gives a good example.

"Pour qui sont ces serpens qui sifflent sur vos têtes."
For whom are those serpents that hiss o'er your heads.

This line represents, graphically, the hissing of the serpents.

The galloping of horses may be assimilated by short syllables imitative of the sounds, as in the following verse from Bürger's Leonore.

"Und hurre, hurre, hop, hop, hop,
Giengs fort in sausendem galopp,
Dass Ross und Reiter schnoben,
Und Kies und Funken stoben."

And hurry! hurry! off they rode,
As fast as fast might be;
Spurned from the courser's thundering heels,
The flashing pebbles flee.
W. Scott's Translation.

But, perhaps, the richest illustration both of onomatopoeia and alliteration is furnished in Southey's nursery rhymes, descriptive of the Cataract of Lodore, and it cannot but be remarked that nearly all the words in the following extract are pure Saxon.

THE CATARACT OF LODORE.

"How does the water
Come down at Lodore?"

* * * *

Helter—skelter,
Hurry—skurry.

* * * *

Rising and leaping,
Sinking and creeping,
Swelling and sweeping,
Eddying and whisking,
Spouting and frisking,
Turning and twisting.

* * * *

And shocking and rocking,
And whizzing and hissing,
And dripping and skipping,
And hitting and splitting,
And rattling and battling,
And shaking and quaking,
And guzzling and struggling.

* * * * *

And bubbling and troubling and doubling,
And rushing and flushing and brushing and gushing,
And flapping and rapping and clapping and slapping,
And curling and whirling and purling and twirling,
And thumping and plumping and bumping and jumping,
And dashing and flashing and slashing and clashing,

* * * * * * * *

And this way the water comes down at Lodore.

The origin of language from the audible sounds of nature was objected to on the ground, that as these sounds are everywhere the same, the words formed to express them should resemble each other in the various languages.

Adelung* meets the objection in the following terms: —"In such cases, when the natural sound is always the same, its designation is in most cases equally so; thus, the name of the cuckoo, is the same in most languages. Many natural sounds, however, differ; *e. g.* thunder; and hence the words designating it, differ also. It must also be taken into consideration, that either from habit or defective organisation, some people do or cannot pronounce certain letters. Thus, the Greenlanders, the Mexicans, and the Chinese, always substitute *l* for *r*, hence thunder, is in Chinese, *lei;* Greenland, *kallak;* Mexico, *tlatnatnitzel.* Substitute the *r* for the *l* and the imitation of the natural sound is more apparent."

But while the theory in question may be safely admitted, in the case of sonorous objects, its application to objects, merely visible and not audible, and still more to intellectual notions is much more difficult. Still, there have not been wanting speculative minds who conceived that, although very obscure, there yet exists an analogy between each object and its name; and that the mechanism of the vocal organs in pronouncing these names bears some relation to the qualities of the objects denoted.

Dr. John Wallis, in his *Grammatica Linguæ Anglicanæ* (1700), has collected a great many examples, to show that a collocation of consonants at the beginning of a word, designates a certain class of ideas.

Str, gives the idea of force and effort, as *strong*, *strike*, *stretch*, *strain*.

* Mithridates.

St, gives the idea of strength, but in a lesser degree, and of stability, as *stand*, *stay*, *stick*, *steady*, *still*.

Thr, violent motion, as *throw*, *thrust*, *throng*.

Wr, obliquity or distortion, as *wry*, *wreathe*, *wrestle*, *wrangle*.

Br, fracture or rupture, as *break*, *brittle*, *brunt*.

Cr, dislocation, straining, as *crack*, *crisp*, *creak*, *crash*; all these are chiefly onomapoietic, other words beginning with these consonants, give the idea of curvature, as *crouch*, *creep*, *crawl*.

Shr, contraction, as *shrink*, *shrivel*, *shrug*.

Gr, rough, hard, as *grate*, *grind*, *gripe*, *grapple*.

Sw, gentle motion, as *sway*, *swim*, *swing*, *&c*.

Sm, similar to the last, as *smile*, *smirk*, *small*.

Cl, adhesion, tenacity, as *cleave*, *cling*, *close*, *&c*.

Sp, dispansion and expansion, as *spread*, *spring*, *split*.

Sl, gently, gliding, as *slide slip*, *slow*, *&c*.

Sq, *sk*, *scr*, violent compression, as *squeeze*, *squint*, *screw*, *squeak*.

While Dr. Wallis's remarks are chiefly confined to his native language, M. Des Brosses,* taking a wider range, endeavoured to discover the cause why such a collocation of letters should denote sensible qualities; and he gives various ingenious and fanciful reasons why *st* should form part of words in most languages denoting firmness and stability; *fl*, fluency; *r*, roughness, &c.

Dr. Alex. Murray, who, from his extensive acquaintance with the oriental languages, was held in high estimation as a philologist, gives, in his History of

* Traité de la formation mechaniqué des langues, 1761.

European Languages, a curious list of the following nine monosyllables, as the basis, and by the help of which the European languages have been formed:—*ag*, *bag*, *dwag*, *gwag*, *lag*, *mag*, *nag*, *rag*, *swag*.

The saying: that there is no theory so absurd which has not, at some time or other, been maintained by philosophers, is equally applicable to philology; for when the mind is strongly biassed in favour of a certain idea, every passing shadow is eagerly grasped to support it. To say that these theories are without any foundation whatever, would be going too far, but this much is certain, that fancy and whim predominated, more or less in their formation. In the condition in which languages are found, it would be too much to expect that these principles should be generally applicable.

An ingenious writer* conceives that mind and body were originally so dependent on each other, that all the mental emotions found their echo in the body, especially in the respiratory and vocal organs. This sympathy, which is still observed in the child as well as in the savage, was very effective in the primitive man, in whom every intuition gave rise to a vocal sound. Another law, not less essential in the creation of language, is the association of ideas; by means of which the sounds which accompanied the intuition became inseparably associated with it, both in man's consciousness and in his memory, and by thus acquiring a signification, became elements of speech.

* Steinthal—Ursprung der Sprache, Berlin, 1851.

As Steinthal does not recognise in the primitive formation of language any act of reason, he appears to hover midway between the innate ideas of Locke, and the pre-established harmony of Leibnitz.

From the circumstance that most of our ideas could be expressed by means of nouns and verbs, grammarians have mostly been of opinion that these are the fundamental parts of speech, from which all other parts have been formed. This assumption is now proved to be erroneous; for recent German and English philologists have distinctly shown that the pronouns and chief prepositions were not derived from either nouns or verbs, but had an independent origin; and that the words denoting *me*, *thee*, *him*, were among the earliest terms of language. The subjoined monosyllabic stems, being the most simple, were, according to Bopp, probably the earliest auxiliaries of signs and gestures; and among the first utterances of human speech, *a*, *i*, *u*, *e*; *ka*, *ki*, *ku*; *na*, *ni*, *nu*; *ma*, *mi*, *mu*; *ya*, *yu*; *va*, *vi*; *da*, *ta*, *sa*.

Leaving, for the present, all discussions as to which parts of speech were first formed, and from what processes the grammatical structure and the inflections of a language took their rise—this much seems clear: that man would have been totally unable to subdue his vocal organs, and to form articulate sounds for the purpose of designating different objects, if he had not possessed the mental capacity of distinguishing their differences and relations. Articulate speech, therefore, grew out of thought. The mere possession of a well constructed vocal and articulating apparatus, would

never have induced man to speak, were it not that it is in harmony with his cerebral development. It is this combination of physical with psychical power which makes it as natural to man to speak as it is natural to the nightingale to sing.

It is, indeed, very probable that every articulate sound or syllable, and every union of sounds or words, must originally have signified something; and have corresponded to some object in the external world. But this material element is continually acted upon by the mind, by which language is produced; for it is intellectuality which is essential to the development of the material.

Language, therefore, is, like man, neither absolutely spiritual nor absolutely material. The formation of conceptions is preceded by the impression made on the mind by external objects; but their embodiment in words is the result of the re-acting formative power of the mind; so that language may be considered as the connecting link between nature and mind, object and subject.

CHAPTER XII.

PRIMITIVE AND COGNATE LANGUAGES.

Proposition 1. The human species is sprung from a single pair, an Adam and Eve.

Proposition 2. The human species is sprung from a number of protoplasts, identical in physical and mental organisation.

Proposition 3. Human beings have been created in masses, simultaneously, or at different periods, in various parts of the globe; and the first progenitors of each race, were analogous, but not identical with regard to physical and mental attributes.

Other propositions may, no doubt, be assumed; the foregoing are, however, the principal assumptions which serve as a starting point to speculators on the earliest history of man in respect to the propagation of the human race.

These hypotheses, though strictly physiological, are cited chiefly with regard to their bearing on language.

If the first hypothesis be true, it is clear there can have been but one primitive language, from which all others must have departed.

If the second proposition be taken as a starting point, there may still have been one primitive language, assuming that not only were the first progenitors homogenous, but confined to a certain locality, and being thus exposed to the same external influence; the same causes would, under the same circumstances, necessarily produce the same effects.

The third assumption clearly leads to the conclusion that there must have been many primitive languages.

Now, just as the ethnological problem is to determine whether the finest living specimen of the Caucasian variety as represented in the statue of the Apollo of Belvedere and the degraded Bosjesmen, can have descended from the same protoplasts, so the philological problem is, whether the language of the latter, said to consist only of a certain number of guttural sounds, apparently incapable of expressing many ideas, can possibly have been derived from the same primitive language as the copious Hellenic tongue. Such are the problems which the greatest philosophers have hitherto vainly attempted to solve.

Herodotus tells us that Psammetichus, King of Egypt, in order to discover which was the oldest language, caused two newly-born children to be brought up by a shepherd, with a strict injunction that they should never hear a human voice; and that

after two years they pronounced simultaneously, on the shepherd approaching them, "*bekos*," which, in the Phrygian language, signifies *bread*: from which it was inferred that the Phrygians were the oldest people, and their language the primitive tongue. Assuming that it is not a fable, such an experiment, if it could be repeated, would certainly prove nothing in favor of *one* primitive language, as, in a state of nature, bread does not exist; but it would certainly demonstrate man's power to form a language.

The battle concerning the unity of the human race, and the existence of a primitive language is still raging—the opposing parties still maintain their ground, and do not admit that anything has been advanced on the other side calculated to invalidate their own hypotheses. But though eminent names, like that of Agassiz, may be found in the ranks of those who insist upon specific differences between the families of mankind, it cannot be denied that the most illustrious physiologists and philologists have, as will presently appear, embraced the more generous side of the question, and are firm believers in the unity of mankind, a faith which not only reconciles us to scripture but to humanity. There is, in fact, much less difficulty attending the hypothesis that mankind form only one species, than the belief that the varieties of the human race are specifically different.

That the peculiarities which distinguish the various races of mankind have remained permanent through the whole historical period, may be admitted; but the differences are so various in their nature, and so imper-

ceptibly graduated, that to make these peculiarities the test for specific differences would have the effect of multiplying the number of species beyond any conception. Alexander von Humboldt expresses, in his "Cosmos," the following opinion on these points:—

"As long as attention was directed solely to the extremes, in varieties of colour and form, the observer was naturally disposed to regard races rather as originally different species, than as mere varieties. The permanence of certain types appeared to favour such a view, notwithstanding the shortness of the interval of time from which the historical evidence was derived. In my opinion, however, more powerful reasons can be advanced in support of the theory of the unity of the human race."

Again, with respect to the importance of language, as bearing upon the question of the unity of the human species he observes:—

"Languages, as an intellectual creation of man, and as closely interwoven with the development of mind, are independently of the *national* form which they exhibit, of the greatest importance in the recognition of similarities or differences in races. This importance is especially owing to the clue which community of descent affords in threading that mysterious labyrinth in which the connection of physical and intellectual forces manifests itself in a thousand different forms."

Wilhelm von Humboldt, not less distinguished in literature than his illustrious brother Alexander in science, also believed in the essential unity of the human race, although he considered that the solution

of the great problem of the first origin cannot be determined by inductive reasoning, nor by experience, so as to furnish a demonstrative proof in the case. He further observes, that while the unity of the species can scarcely be determined from philological data, "yet *its elucidation ought not to be sought from other sources. Language, more than any other attribute of mankind, binds together the whole human race.*"*

Cuvier is well known to have maintained the unity of the human species.

Johannes Müller was of opinion that "The different races of mankind are forms of one sole species. But whether the human races have descended from several primitive types, or from one alone, is a question which cannot be determined by experience." He held, at the same time, that the results of physiological researches show nothing against its assumption.

On comparing two languages, it will be found, that they resemble or differ from each other, either in words and grammatical structure, or in both. It was but natural that the old philologers should consider verbal resemblances as a sure index of the relationship of languages. Hence arose a pack of word-hunters, who ransacked every dialect, and hunted and grasped with an avidity, bordering on the ridiculous, the remotest similarity presented by words, in order to prove the connection of languages. But as philology advanced, it was soon ascertained that resemblances in words alone are, after all, fallacious guides, unless grammatical tests confirm their indications.

* See Humboldt's work on the Kawi language.

The chief grammatical systems employed in the formation of languages are:—

1. By changing the letters composing the roots.

2. By the addition of formative syllables to the root.

3. By employing separate words instead of changing the roots.

The second system is that which was chiefly employed in the structure of the most cultivated languages. It consists in bending the roots (inflection), by the addition of syllables. Thus we find in the Greek and Latin languages, the nouns inflected in the various cases, genders, and the verb for the various tenses, &c.

Comparative philology, dating like comparative anatomy and physiology, to which it bears a certain resemblance, only from the present century, may be termed a new science. By means of the philological scalpel, the spoken dialects of living, and the written relics of extinct languages, have been dissected and submitted to the philological microscope, so that it has been found possible to trace the relationship of the greater number of the three or four thousand dialects* spoken by the bulk of mankind, and to arrange them into families.

Just as an accomplished physiologist, like Professor Owen, is capable from the inspection of a single bone of an extinct animal, to construct the whole skeleton, and to indicate the habits and instincts of the animal to which it belonged, so can the skilful philologer frequently, from the presence of a single letter in a sen-

* Adelung in his "Mithridates," a work which has given a great impulse to philological research, computes, from necessarily imperfect data, the number of languages to amount to about 3064.

tence, determine the type of the language of which it forms a part.

Grimm* recognises three periods in the development of languages. In the first, language was poor and simple, consisting only of some hundreds of roots without flexions; the second, is the period of synthetic inflections, consisting of parasitical syllables affixed to the radical, constituting only one word, as in the Sanskrit, Greek, Latin, &c.; and a third period in which the people, incapable of observing so complicated a grammar, break up the unity of the inflected word and prefer the inverse arrangement of particles of expression, so that the inflection and the particle are placed as distinct words before the terms which they modify.

Grammar being thus considered as the very soul of language and much less likely to be changed by time and other influences than the words, is now considered a much more reliable test than mere verbal coincidences.

It can easily be shown that languages may have many words in common without being nearly related, and on the other hand, may apparently have but few verbal resemblances, and yet be closely allied.

The Persian, for instance, contains through the introduction of the Koran, an immense number of Arabic words, yet the grammar underwent but little change, and so is it with the Turkish, which is equally impregnated with Arabic words without being much influenced by Arabic grammar. The Spanish vocabulary also con-

* Ursprung der Sprache.

sists of about one third of Arabic words, but shows no trace of Arabic grammar.

Again, there is a mixed unwritten vagabond dialect, called the *Lingua Franca*, used as a means of communication between the inhabitants of the opposite coast of the Mediterranean. The language is a sort of miscellaneous depôt of a rabble of words from Africa, Europe, and Asia. But though only one word in eight is Italian, the grammar belongs to that language, and stamps it as its progeny.

The English being the *facile princeps* of mixed languages admits of whole sentences and paragraphs consisting almost entirely of Graeco-Latin words as the following few specimens show:—

Virtue creates felicity, vice produces misery; Ignorance induces superstition; Popular education eradicates prejudice; Intemperance causes crime.

Now if any person ignorant of English, but acquainted with Latin, were called upon to determine the family of the language in which these sentences occur, he would naturally pronounce it to be neo-Latin, or Romance; not so the philologer.

"The *s*," as Professor Max Müller justly observes, "suffices to stamp the language in which it forms the exponent of the third person singular, as Teutonic, and not Romance, the grammar giving life and vigour to its parts, native and foreign, is still Saxon."

Classification of Languages.

Languages may be classified:—

1. According to their geographical distribution, such

as the Asiatic, European, African, American, and Polynesian languages.

2. According to the varieties of man by whom they are spoken; such as the Caucasian, Mongolian, Ethiopian, American, and Malay languages.

3. According to certain general characters, such as monosyllabic, dissyllabic, polysyllabic, inflectional, synthetic, or analytic languages.

Some philologists have divided all languages into three groups, and have named them after the sons of Noah, the Semitic, Chamitic, and Japhetic languages.

The following division seems to be best adapted for popular exposition.

1. The Chinese class.
2. The Turanian class.
3. The African class.
4. The Polynesian class.
5. The American class.
6. The Semitic class.
7. The Arian class.

The Chinese and Indo-Chinese Languages.

The language of the Chinese is no less singular than the people by whom it is spoken. "How can you fathom or deal with a people," asks the Correspondent of the *Times*, writing "from Kwang-tung (Canton), whose language has neither alphabet or grammar?" Surely if there be an original language, it must be the Chinese, which has neither borrowed from, nor lent anything to any other tongue.

All other languages have, more or less perfectly, certain distinctive forms for the noun, the verb, and the copula in the construction of a sentence. Nothing of the kind exists in the old Chinese, and if in the modern style, certain words are used resembling particles and conjunctions of other languages, these sounds are still roots incapable of change.

The name of monosyllabic languages given to this class arises from the circumstance that the words of which they are composed consist only of one syllable. To express a compound idea, they do not, like other nations, glue together two syllables in forming a compound word, but merely place them in apposition in the same way as we say hat-box, carpet-bag. The number of monosyllables composing the Chinese languages is variously estimated from 350 to 450, each beginning with a consonant and ending with a vowel or liquid, or the double consonant *n g*. This small number of radical words the Chinaman contrives to quadruple by means of intonations, so that his vocabulary consists of about 1400 words incapable of inflection, and which must act all the parts of speech, according to their allocation in a sentence. The inadequacy of such a language as a colloquial medium is strongly commented on by the Rev. C. Gutzlaft, the celebrated Chinese Missionary—"The poverty to which the language is reduced is such as to occasion misunderstanding in sentences of the most frequent occurrence, and to make conversation so exceedingly monotonous as to comprise only the ordinary objects of life. Whenever any attempt is made to discuss more abstruse

subjects, recourse must be had to pen and ink, and paper."

It is thus not without reason that Adelung attributes the little progress which the Chinese have made in science to the structure of their language. The pretended strict examination of the candidates for office consists chiefly in tiresome trials of skill in comprehending, imitating, and mastering the written characters, and a knowledge of ethics, as contained in their sacred books, and which appears to differ as much from their practice, as their colloquial dialects differ from the written language.

The redoubted Yeh furnishes a good example in point. According to his own account* he rose to his rank through his having been second wrangler at the public examination. Yet this, all but the most accomplished man in the Chinese empire, seemed, excepting in his specialty, the *Taoli*—into the mysteries of which "our own Corrrespondent" found it impossible to penetrate—ignorance incarnate, in all that, according to our ideas, constitutes real knowledge.

Dr. Bowring, Her Majesty's Consul at Hong-Kong, gives the following interesting account of the Siamese language, also belonging to the monosyllabic class.†

"With few exceptions, the Siamese is a monosyllabic language; and those exceptions are almost wholly found in foreign words. In proportion to the elevation of style is the number of words of Sanscrit and Pali origin, but accommodated to Siamese pronunciation.

* Correspondent's letter, *Times*, May 11, 1858.
† "The Kingdom and People of Siam."

The highest idiom is that of the sacred books; the second is the language of the higher order; the lowest, that of the people.

It is a language of tones or cadences, which give a different meaning to words, whose alphabetic forms would be the same. Hence the language lends itself to jokes and equivocations of all sorts; and many a word *idem sonans* to an unpractised ear, presents distinctions marked and obvious to a Siamese.

Auxiliaries are employed to give to nouns and verbs the various significations which result from declensions and conjugation. Most words may be used as adjectives, verbs, or adverbs, by changing their position, or adding another word to modify the same. Auxiliary words express the past, the present, the future; and a single particle transfers an active into a passive verb. The slight modification of sounds and words apparently the same, and which give a completely different signification, makes the pronunciation of the Siamese language difficult to strangers, and leads to many mistakes. For example, in the sentence "*khai khai kai khai na khai?*" "*Ha nie khai pha khai khai.*" The import is, "Is nobody selling eggs in the city?" "the seller is ill;" but the various *khai*, by shortening, lengthening, and intonating them according to their meaning, leave no doubt of the meaning in the mind of a Siamese hearer.*

* So in Chinese—"*Chi chi chi chi lu.*" "I know the way that leads to the place." "*Hioh chi chi poh wei jü chi chi chi yaw, chi chi chi yaw wei yi chi chi shih.*" "To know the requirements of virtue is more important than to know what virtue is, but the knowledge of these requirements is less important than the practice of them."

There are no less than six tones in the language—the abrupt, the short, the long, the high, the low, and the middle. They have been compared: the abrupt, to a demi-semiquaver; the short, to a semiquaver; the long, to a double note; the high, an ascent from sol to si; the descent from sol to re, touching slightly the intermediate notes.

Mr. Taylor Jones* says that from want of attention he has known proficients expose themselves to ridicule and be unintelligible for years, and he abandons all attempts to represent the combinations of Siamese characters by the English alphabet."

The monosyllabic class presents, in its bearing upon the question of the unity of languages and mankind, the remarkable aspect, that physiology and glottology seem to be completely at issue. There is, in every respect, such a physical resemblance between the Chinese and the Tatars, that no writer ever thought of assigning to them a distinct origin, and they are, therefore, in all ethnological works, included in the Mongolian variety; yet their languages exhibit scarcely any trace of relationship.

This great difficulty, which could not easily be passed over by the advocates for the unity of languages, is disposed of by Chevalier Bunsen† in the following terms:—

"There *is* a gap between the formation of the Chinese and the other languages; but that gap probably corresponds to that caused in the general development of the

* "Grammatical Notices of the Siamese Language."
† "Report to the British Association, 1847."

human race, by great destructive floods, which separate the history of our race from its primordial *origines*. In this sense, the Chinese may be called the great monument of antediluvian speech. Indeed, the first imigration is said, in Genesis, to have gone eastward."

The Turanian, Tatar or Nomadic Languages.

The Turanian* family comprehends, excluding the Chinese dialects, all languages spoken in Asia and Europe, which do not belong to the Iranian or Semitic families. The Mongolic, Tungusic, Samoïedic, Finnic, Turkic, all form branches of the Turanian stock. The difficulties of tracing linguistic relationship, as in other families, is owing to the few monuments of civilisation which the Turanian can shew. There is, however, one characteristic feature which distinguishes this family—the principle of *agglutination*. The process consists in gluing together, or in aggregating, a number of elemental sounds, and thus forming new words.

The Turanian dialects are frequently called Tataric languages, as Tatar† was the original name of the

* According to Persian mythology, Feridun, the ruler of Iran, divided his empire among his three sons, Tur, Silim or Salm, and Frij or Eril. Tur received the north and the east, Salm the west, and Eril the south. Tur and Salm murdered Eril, hence the constant enmity between Turania and Iran.

Tura (Lassen "Indische Alterthumskunde,") signifies *quick*, from the root *tuar*, to run, to fly, and thus their very name is characteristic of their Nomadic habits. They always appear in India, as well as on the inscriptions of Persia, as the Aniran, or No-arian people; that is as the enemies of the agricultural and civilising nations.

† Tatar, from the Turanian root, *tata*, to draw the bow or to pitch tents.

Mongolic race. The Tatar, or Mongolian empire, extended in the middle of the thirteenth century, from China to Poland. Baber, a descendant of Timur, founded the Mongolian dynasty, reigning as Great Moguls of Dehli, the last scion of which, now awaits his sentence. To the Turanian family belong, also, the dialects spoken in the valleys of Mount Caucasus, as well as the Tai and Tamulic branches.

That very curious isolated language spoken in the Basque provinces of France and Spain, in the Pyrenees, which the people now call *Escuara*, or *Euskaldure*, was, for a long period, considered to be a dialect of the Celtic. The more recent investigation, however, of W. Von Humboldt and others seem to show that this peculiar language was once spoken all over the Peninsula, prior to its occupation by the Arian stock. The people who speak the Basque, are perhaps the descendants of the ancient Iberi, probably a Turanian race, and their language is certainly much closer related to the Turanian than to the Iranian stock.

The African Languages.

African philology appears to have been greatly neglected until the appearance of Adelung's great work, *Mithridates* (1817), in which the affinities of the languages of Ethiopia with those of Arabia, confirmed by modern researches, were already indicated Balbi, in his *Atlas Ethnologique*, enumerates 112 African languages and dialects, which Dr. Latham, in the account

given by him to the British Association, in 1847, divides as follows:—

1. The Coptic class, containing the extinct dialects of Africa.

2. The Berber class, containing the non-Arabic languages of Northern Africa.

3. The Hottentot class.

4. The Kaffir class.

5. An unnamed class falling into eleven subordinate groups.

The first class, the ancient language of Egypt, also called the *Chamitic* language, is, in many respects, the most interesting, appearing, from its structure, to form *either* a connecting link between the Semitic (Syro-Arabian), and the Japhetic (Indo-European) languages, *or* a branch of the primitive stock from which the Semitic and Japhetic languages have sprung.

Another remarkable African dialect may be noticed here, namely, the Poongwee language, spoken in the parts adjoining the Gaboon river. The missionaries of these parts, who have framed a grammar of this language, state that "it is one of the most perfect languages of which they have any knowledge. It is not so remarkable for copiousness of words, as for its great flexibility. Its expansions, contractions, and inflections are all governed by grammatical rules, which seem to be well established in the minds of the people. How a language so soft, so plaintive, so pleasant to the ear, and, at the same time, so copious and methodical in its inflections, should have originated, or how the people are enabled to retain its multifarious principles so distinctly

in their minds as to express themselves with almost unvarying precision and uniformity, are points which we do not pretend to settle. It is spoken, coastwise nearly two hundred miles, and perhaps, with some dialectic difference, it reaches the Congo river. How far it extends into the interior is not known."*

Considerable interest is attached to the collection now forming at Cape Town, by Sir G. Grey, Governor of the colony, of all tracts existing in the native languages of South Africa. The collection already consists of 1500 volumes, and the first part of a catalogue, containing the titles of grammars and lexicons, has just appeared. The work is to be completed by a supplemental catalogue of the languages of North Africa.

The Malayo-Polynesian Languages.

The views entertained by scholars as to the languages spoken in Polynesia and the Indian Archipelago are as conflicting as those with regard to the races which inhabit these parts. Already Mr. Marsden, in his miscellaneous works, had remarked that there is a manifest connection in these languages, insomuch that we may pronounce the various dialects in a collective sense, to form substantially one great language. Humboldt, in his posthumous work "On the Varieties of Human Language," &c., gave weight to this theory. With a mind constantly directed to the problem of the

* Extract from the "Progress of Ethnology," by J. Russel Bartlett. New York, 1847.

unity of language, he endeavoured to establish that the languages of the inhabitants of the islands in the Pacific Ocean, to which the name of Malayo-Polynesian is given, were at some period intimately connected, so that he thought already of linking the whole of this family with the Arian, through medium of the Sanscrit. Humboldt's theory was, however, not allowed to remain unchallenged.

"I cannot help thinking," says Mr. Crawford* "that this hypothesis must have originated in this eminent scholar's practical unacquaintance with any one language of the many which came under his consideration;" and he expresses his conviction "that there is no more ground for believing that the Phillippine and Malayan languages have a common origin than for concluding that Spanish and Portuguese are Semitic languages, because they contain many Arabic words." Some scholars consider Mr. Crawford's tests for the relationship of languages are founded upon too general principles. Be this as it may, certain it is that Humboldt's great work has opened a rich mine of philological research.

The American Languages.

The first remarkable fact which presents itself with regard to the American languages, is their number, which appears to be in inverse proportion to the population. Balbi, in his *Ethnographical Atlas*, enumerates

* "Grammar and Dictionary of the Malay Language." By J. Crawford, F.R.S.

four hundred and twenty-three ; while Vater, in *Mithridates*, says that the languages spoken by the indigenous population exceeded, at no distant period, five hundred. This multiplication of languages is accounted for by the absence of most of the conditions which give stability to a language. It is generally found that among a dense population, who are fixed in their habitations, language has a tendency to be uniform, while wherever the population is scattered and wandering, language necessarily is split into many forms.

Not less striking is the phenomenon that this diversification of languages is throughout pervaded by an analogy of structure, which can scarcely be merely coincidental. "Striking analogies of grammatical construction," says W. Humboldt, "are discovered, not only in the more perfect languages, as that of the Incas, the Mexicans, &c.; but also in languages extremely rude. It is in consequence of this similarity of structure that the Indians of the missions could learn the tongue of a different tribe much more easily than the Spanish."

A peculiar process of compounding words combining a number of ideas, is one of the characteristics which distinguishes the American languages from those of the old world. By such means the number of words can be increased to any extent. "For example," observes M. du Ponceau,* "when a Delaware woman is playing with a little dog or cat, or some other young animal, she will often say to it, *kuligatchis*, which I would translate in English—"Give me your pretty

* "Report of the American Philosophical Society at Philadelphia."

little paw." This word is compounded thus: *K* is the inseparable pronoun of the second person, and may be rendered *thou* or *thy*, according to the context; uli (pronounced oolee) is part of the word *wulit*, which signifies handsome or pretty; *gat* is part of the word *wichgat*, which signifies a *leg*, or *paw;* schis (pronounced *shees*) is a diminutive termination, and conveys the idea of littleness: thus in one word the Indian woman says "Thy pretty little paw.'"

M. du Ponceau also expresses his opinion that if the Delaware language had been cultivated and polished, like those in Europe, and if it had had a Homer or a Virgil, it is impossible to say to what degree of perfection the language could be carried. The classical languages have been admired for their many compounds, but what are they to those of the Indian languages!

It is, therefore, not surprising that the American languages should have created the greatest curiosity among the learned, who looked upon the compound structure of a language as the index of it development.

Other views, however, prevail at present; for in tracing the history of languages, it is invariably found that they are more complicated in a primitive age, when they exhibit a strong tendency to exuberance.

"That the plan," observes Mr. Schoolcraft,* "is in the American languages, homogenous, from a peculiar view of the use of words in their concrete form, appears to be a fact established by investigation. The attempt

* Historical and Statistical Information.

is perpetually to speak of objects in groups. There are heaps of syllables clustered, as it were, on a polysyllabic stem. The developement of this plan may be said to be recondite, creating the idea of many plans of thought; but there is, in fact, only one generic scheme tending to denote compound impressions. The term *encapsulated* has been used to denote the structure which the words assume. They are, indeed, clustered thoughts expoliating thoughts, as capsule within capsule, or box within box."

According to this opinion, proceeding from a scholar who has done more than any one living for the elucidation and preservation of the Indian languages, it would appear that the elder philologists were, by employing fragmentary materials, too hasty in their conclusions.

The term polysynthetic, or many compound, which Du Ponceau applied to the American languages, and by which name they have hitherto passed, is objected to by Dr. Lieber, on the ground that it seems to indicate that what has been separate has been put together, as if man commenced with analysis, while, in fact, he ends with it.

As to the affinities of these tribes with the rest of mankind, all is mere conjecture. In *Bradford's American Antiquities*, there is an hypothesis by no means improbable, that the red man is of Mongolian origin, and reached America by the Islands of the Pacific, while others advocate the probability of a Semitic origin for at least the northern stocks.

The Semitic Languages.

The Semitic (language of Shem), or Syro-Arabian languages, are usually divided into three principal branches—the Aramaic, the Hebrew, and the Arabic. The most extensive branch of this family, the Arabic, is still spoken by the aboriginal inhabitants of the Arabian peninsula, and is the vulgar language on the shores of Africa, serving as a means of communication in many parts of Asia. The Aramaic, comprehending the Syrian and Chaldean dialects, is spoken by a few tribes, such as the Nestorians in Kurdistan, sometimes called Chaldeans.

The Hebrew is no longer a living language, but was, after the conquest of Palestine, about the eighth century, replaced by the Arabic.

The ancient Ethiopic, or Abyssinian, called also the Gees language, may also be mentioned as a Semitic dialect, still spoken, though very impure, by the people of Habesh.

The Semitic tongues differ from other classes of languages, not only in their grammatical system, but in their radical words. The verbal roots in the Syro-Arabian dialects, are generally dissylabic, consisting of three letters which are consonants, between and after which the vowels are inserted.*

Besides the Carthaginian and Phœnician languages,

* According to the opinions of Gesenius, Ewald, and other Semitic scholars, these languages were originally monosyllabic, which could be proved by a dissection of their roots.

which belong to this family, modern researches have shown that the Egyptian (Chamitic) language, bears a decided Phœnician stamp; while the discoveries of Rawlinson and Dr. Hinks have more than confirmed the probability of the Semitic origin of the Babylonian or Assyrian language.

The Arian Languages.

The Japhetic or Indo-European languages are now generally called the *Iranian** or *Arian* family; *Arya* being the name by which the ancestors of this family were known. Arya in the Sanscrit means "venerable, a Lord." The holy land of the Brahmans is still called Arya-âvarta the abode of the Aryas.† Herodotus mentions that the Medians called themselves *Arioi*, and in the cuneiform inscriptions Darius called himself an Arian, and the kings, as already stated, called themselves "Kings of the Arian and Un-Arian races," hence, the modern names of Arian and Iranian.

The Arian family includes:—

1. The Sanskrit, the Zend, the modern Persic, and other Indian dialects.

2. The Celtic, with its two great varieties, the Irish and Welsh, and their subordinate dialects

3. The Pelasgic, or classical, with the Greek and

* *Iran* was the ancient name of that district in Asia, which is washed by the sea in the south, and bounded on the other sides by the Tigris, the Oxus, and the Indus. It is considered as the birthplace, or at any rate, as the cradle of the Iranian or Indo-Teutonic stock.

† Max Müller, loc. cit.

Latin at the head, and their derivative languages, the modern Greek, the Italian, French, Spanish, &c.

4. The Sarmatian, or Slavonic, including the Russian, Polish, Bohemian, &c.

5. The Gothic, including all the Germanic and Scandinavian tongues.

The most primitive type of this family, is the *Sanscrit* —the language of the *Vedas*, a name especially applied to the four sacred books of the Hindus, who believe that they issued from the mouth of Brahma, and that the world itself was created according to the laws of a pre-existing Veda. These four books are respectively named, the Rig, Yajush, Saman, and Atharvana. The Rig has been recently published by Prof. Max Müller.

The Sanscrit introduced into India by the Brahminical race, gradually supplanted the aboriginal languages, which only survive in the Tamul and Telinga dialects, spoken in the Southern Deccan.

From the Sanscrit sprung the *Pracrit* (derivative dialects), from which the Indian languages originated. The Pali-dialect—the sacred language of the Buddhists —is considered as having least deviated from its original.

Sir William Jones was one of the first who drew attention to the remarkable structure of the Sanscrit. He considered it "more perfect than the Greek, more copious than the Latin, and more exquisitely refined than either—yet bearing to both of them a stronger affinity, both in the roots of the verbs and in the forms of grammar, than could possibly have been produced by accident; so strong, indeed, that no philologer

could examine them all three without believing them to have sprung from some common source, which, perhaps, no longer exists. There is a similar reason, though not quite so forcible for supposing that both the Gothic and the Celtic had the same origin with the Sanscrit. The old Persian may be added to the same family."

With the study of the Sanscrit a new era commenced in the history of languages. The remarkable work of Francis Bopp proved the supposed connexion of the Arian languages—the Sanscrit, Zend, Greek, Latin, Lithuanian, old Slavonic, or Vindic, Gothic, and German, to be a great fact.

"Most European languages," observes Dr. Bopp,* "do not need proof of their relationship to the Sanscrit, for they show it by their forms, which, in part, are but very little changed. But that which remains for philology to do, and which I have endeavoured to the utmost of my ability to effect, was to trace, on the one hand, the resemblances into the most retired corner of the construction of languages; and on the other hand, as far as possible, to refer the greater or less discrepances to laws through which they become possible or necessary."

Yet though the Sanscrit is, as Prof. Bopp says, more organic in structure than other Arian languages, and although it is older than the Greek of Homer, or the Persian of Cyrus, Bopp guards himself against the assumption that the other languages were actually

* "Bopp's Comparative Grammar," translated by Professor Eastwick.

derived from it; he considers the Sanscrit merely as the elder sister.

The following terms expressing the degrees of consanguinity in the principal branches of the Arian class, may serve as an illustration of their affinity:—

	Sanscrit.	Greek.	Latin.
Father	pitâr	pater	pater
Mother	mâtâr	meter	mater
Brother	bhratar	phrater	frater
Sister	svâsar		soror
Daughter	duhitar	thugater	
Son	sunus		

	Teutonic.	Slavonic.	Irish.
Father	fadrein vatar	bat	athair
Mother	mutter	motar	mathair
Brother	brôthar	brat	brathair
Sister	swistar	sestra	siur
Daughter	dauhtar	dukte	dear
Son	sunus sohn	syn	

A vast many other words might be enumerated in support of the affinity of these languages, but the above table may be sufficient to show that before the Arian race separated, the various degrees of relationship had already been determined in language.

The identity of the Indo-European languages has been further demonstrated by Jacob Grimm's important discovery of the systematic displacement or correspondence of consonants in the formation of many of the principal words in Sanscrit, Greek, Latin, and German. This doctrine of sounds, generally called "Grimm's

Law," has since become an important test in comparing languages, and to establish true etymologies.

GRIMM'S LAW.

LABIALS.

Greek (and generally	Sanscrit, Latin, and Lithuanian)—			
„ P cor. with Goth.	P H (f)	and old High Germ.		B. (v f)
„ B „	P	„	„	P H (f)
„ P H (f)	B	„	„	P

DENTALS.

„ T cor. with Goth.	T H	„	„	D
„ T H	D	„	„	T
„ D	T	„	„	T H (z)

GUTTURALS.

„ K (c) cor. with Goth.	K H (h g)	„	„	G (h)
„ G „	K	„	„	K H (ch)
„ K H (ch)	G	„	„	K

It is beyond the scope of this work to treat of the various languages belonging to the Arian family, except with regard to the Teutonic branch, the basis of our own language, which will form the subject matter of the next chapter. In order, however, to state the results arrived at by modern investigators in relation to the affinity of mankind and their idioms, the following extracts from the report presented to the British Association by Chevalier Bunsen cannot but prove acceptable to the reader.

The general conclusions to which we are conducted, after stating the two possible hypotheses—first, that there have been great number of beginnings, and second, that the beginning of speech was only made once, Bunsen sums up as follows:—

" If the first proposition be true, the different families

of languages, however analogous they may be, as being the produce of the same mind upon the same outward world, by the same organic means, will nevertheless, offer scarcely any affinity to each other, in the skill displayed in their formation and in the mode of it, but their very roots full or empty ones, and all their words, whether monosyllabic or polysyllabic, must needs be entirely different. There may be some similar expressions in those inarticulate bursts of feeling not reacted on by the mind which the grammarians call interjections.

There are, besides, some graphic imitations of external sounds, called *onomatopoetica*-words, the formation of which indicates the relatively greatest passivity of the mind. There may be, besides, some casual coincidences in real words; but the law of combination applied to the elements of sound, gives a mathematical proof that, with all allowances, such a chance is less than one in a million for the same combination of sounds signifying the same precise object. This chance is still considerably diminished if the very strict and positive laws are considered, which govern the application of a word to a given object. But the ordinary crude method suffices to prove that if there are entirely different beginnings of speech, as philosophical inquiry is allowed to assume, and as the great philosophers of antiquity have assumed, there can be none but stray coincidences between words of a different origin. But the results of the most accurate linguistic inquiries, prove that such a coincidence does exist between the three great families, spreading from the north of

Europe to the tropic lands of Asia and Africa. It exists there, not only in radical words, but even in what must appear as the work of an exclusively peculiar coinage, the formative words and inflections which pervade the whole structure of certain families of languages, and are interwoven, as it were, with every sentence pronounced in every one of their branches. All the nations which, from the dawn of history to our days, have been the leaders of civilisation in Asia, Europe, and Africa, must consequently have had one beginning." (Rep. p. 294.)

This statement, referring specially to the Semitic, Japhetic, and Chametic languages, is equally true of the forms referable to the Turanian stock, which, according to Bunsen's estimation, is a branch of the Japhetic. Thus, by establishing the common origin of all the languages of the globe, the hypothesis of the original unity of mankind is strengthened.

Lastly, it must be stated that the conclusions with regard to the affinity of races, and their languages, embodied in the above report, do not essentially differ from those arrived at by the late Dr. J. C. Prichard, whose writings on this subject, though first published in 1813, have as yet lost nought of their standard value.*

* *Researches into the Physical History of Mankind*, by J. C. Prichard, M.D.

CHAPTER XIII.

ORIGIN AND DEVELOPMENT

OF

THE ENGLISH LANGUAGE.

The bare history of a people furnishes us with their growth, development, and decay; an account of their language records their feelings, thoughts, and modes of reasoning. The history of a nation is thus intimately connected with that of their language—they mutually assist and throw light on each other, so that a knowledge of the rise and gradual development of the language spoken by a people, is not merely the history of their psychical life, but to a great extent, that of their physical progress. Our own tongue affords, in this respect, the most striking illustration; the history of the origin and growth of the English idiom, is the history of England. Language may, therefore, without much impropriety, be called the *psychogram of man's inward nature.*

That large division of the human race, called the Arian family, emigrated from the highlands of Asia towards a north-western direction, when, on arriving upon the confines of Europe they appear to have separated. One branch, the Pelasgic, colonised the southern peninsula ; another, the Celtic, possessed themselves of central and western Europe, from which they were gradually dislodged by a third branch of the Arian family, the Teutonic tribes, who, in the progress of time, occupied the whole country, extending from the middle of Scandinavia and the Gulf of Riga to the Rhine and the Alps, and the junction of the Theis with the Danube.

The question whether the Arian races found, on their arrival in Europe, the different countries already occupied by previous inhabitants is, according to late ethnological researches, answered in the affirmative. Professor Nillson, of Lund, has, with regard to the primitive inhabitants of Scandinavia, come to the conclusion that Sweden was, at a period while some of the long extinct herbivorous animals existed, possessed by a human population in a very low state of civilisation, ignorant of the metallurgic art, constituting their weapons of horn and stone, and living chiefly by fishing and hunting. Their skulls, found in the earliest class of Barrows, are described as short, with prominent parietal tubers, and broad and flattened occiputs. This family was succeeded by a superior race. The third race, apparently of Celtic origin, was not in Nillson's opinion displaced by the true Swea, or Modern Scandinavians, till some time in the sixth century.

With regard to the primitive inhabitants of Great Britain, it is known that the Celts appear to have occupied it at the earliest period of which we have an authentic account. Yet there are some indications furnished by the relics found in the tumuli in Great Britain and the whole of the north of Europe, that the Celts were intruders, and that there may have existed in Great Britain a primitive race prior to them. The ancient crania appear to differ from those of the true Celtic type, not merely in shape and form of the skull, but in the state of the teeth. At present, all is as yet mere speculation, and a greater accumulation of facts is requisite to establish absolute conclusions.

The *Teutonic branch*, from which many of the modern nations of Europe and America derive their origin, were at an early period divided into tribes, which either belonged, or did not belong, to the great Suevian confederation, possessing some broad marks of distinction—thus, the Suevi were chiefly nomadic tribes, the Non-Suevi were agricultural, and had fixed habitations; the Suevi spoke what was called high German, the dialect of the Non-Suevi was low German. The Alemans, Bavarians, Burgundians, Goths, Vandals, and Gepidae belonged to the Suevi; the Franks, Saxons, Longobards, and Frisians, to the latter. When the Suevian confederacy was broken up, others were formed, among the most powerful of which were the Franks, the Alemans, the Saxons, and the Goths.

It is only from the beginning of the third century of our era that we possess some historical account of the movements of the Goths. It appears that they crossed

the Baltic from Scandinavia, in which a considerable district is still called Gothland, ascending the Vistula, and ultimately reached as far as the Black Sea. They soon became powerful, and engaged in conflicts with the Roman empire; and their princes, who were captured, were paraded in the triumphal processions of the Emperor Aurelian. The Goths, however, on their side, also captured many Romans, some of whom were Christians, by whom, in process of time, they were converted to the Christian religion.

The establishment of Christianity naturally created, in its disciples, a desire to read the scriptures in their own language. But until this time, the Teutonic tribes had no alphabet but the Runic characters, chiefly employed for charms and inscriptions. It is to Ulphilas, Bishop of the Moeso-Goths, formerly settled in Lower Moesia, the country now called Bulgaria, that the honour is ascribed of having partly invented and adapted to his own language the Greek and Roman characters. We still possess portions of his famous Moeso-Gothic version of the New Testament, originally executed in the fourth century, exhibiting the language in an early, though not its earliest state. An imperfect manuscript copy of this work, found in the Abbey of Werden, in Westphalia, is now preserved in the University of Upsala, in Sweden. The manuscript is of singular beauty, the letters being all silver, excepting the initials, which are gold, upon vellum of a violet colour. There has also been discovered a portion of a commentary of the Gospel of St. John in the Gothic

language, and published in the edition of Ulphilas, by Gabelentz and Loebe, at Leipsig.*

This invaluable work, called the *Codex Argenteus*, supposed to be of the sixth century, had already lost one hundred and forty-three leaves, when in 1658 it became Swedish property; but in 1834 it was discovered that ten more leaves were wanting, which had evidently been cut out; an act of Vandalism which was currently reported to have been perpetrated by two Englishmen. Some time ago, however, Mr. Uppström, the editor of a quarto edition of the whole Codex, received, to his great delight, the missing ten leaves from an old Swedish collector, then on his death-bed. The leaves formed a portion of the Gospel of St. Mark, and were in good preservation.

It appears that Hertz, of Berlin, has made arrangements for the publication of photographic copies of the original, with illustrations, provided he meets with due encouragement.

The version of Ulphilas, made between 360 and 380, is by nearly three centuries older than any other Gothic document we possess; but even at that time the language bears the stamp of great vigour, possessing, at the same time, a great capacity for inflections.

Arrival of the Jutes and Saxons in England.

The ancient Britons, being sorely pressed by the Picts and Scots, implored, during the reign of Vortigern,

* A specimen of the Lord's Prayer in Gothic, with a translation, will be found in another part.

the aid of the Teutonic tribes, who inhabited the north of Germany. The first who came called themselves Jutes, and had as their leaders Hengist and Horsa. Having obtained possession of the Isle of Thanet, they, a few years afterwards (449), established the kingdom of Kent. Then came the Saxons, who, in 477, under Ella, established the kingdom of South Saxons (Sussex). Other Saxon invaders landed in Hampshire, and established, in 594, under their leader, Cedric, the kingdom of the West Saxons (Wessex), and of Essex, in 527.

From this time the Angles, who inhabited a district called Angeln, in Schleswig, in the north of Germany, sent forth, during a period of sixty years, colony after colony, who formed settlements, and becoming at last the most powerful and numerous of the invaders, gave to the country their name and their language. The ancient Britons, who had embraced Christianity at a much earlier period, were driven into Cornwall and Wales by their heathen invaders.

There were eight kingdoms founded in Britain by the Teutonic tribes, previous to 586—one Jute, three Saxon, and four Angle, all of which spoke low German.

It may, however, be necessary to inform the reader, that the narratives of the Saxon invasion of Britain can scarcely be said to possess a strictly historical character.

"The ordinary notion," says an eminent English antiquarian,* "that the first settlement was that under

* *The Celt, the Roman, and the Saxon*, by Thos. Wright, F.S.A., 1852. See also Lappenberg and Kemble, on the Early History of the Anglo-Saxons.

Hengist and Horsa, has arisen from the circumstance that the Anglo-Saxon accounts of these events were founded on the traditions of Kent. It is probable, however, that they had been preceded by the Angles in the north; for when we first become acquainted with them, this tribe seems to have been long in undisturbed possession of the whole country, from the Humber to the wall of Antoninus, which was formed into two kingdoms, that of Bernicia (Northumberland, &c.), and that of Deira (Yorkshire, &c.)"

"The *Saxon Chronicle*, composed ages afterwards, gives us the first narrative of the wars between the Saxons and the Britons in the south, after the former had gained a footing there; it is founded on the Anglo-Saxon traditions, perhaps on poems, and there are circumstances about it which lead us to believe that it is partly romance. Even the names of Hengist and Horsa are supposed to be mythic."

Language and Literature.

The Anglo-Saxon language can scarcely be said to have become fixed in England until after the arrival of St. Augustine, who was sent by Pope Gregory to convert the Saxons, and who preached to Aethelbert, King of Kent, in the year 597.

Among the earliest compositions extant in the Anglo-Saxon tongue, must be mentioned the poems of Caedmon, neat herd to the monastery of Whitby, then lately founded by Hilda, a relation of Edwin, King of Nor-

thumberland. We are told, that being one day seated at table, when the harp was moved towards him, he retired from the company, conscious of his deficiency, and took refuge in the stable. Here, as he slept, some one, as he thought, appeared to him, and bade him sing. Caedmon made the attempt, and sung a hymn, which he repeated next day in the presence of Hilda, and to the admiration of all who heard him. At the solicitation of Hilda, who believed that he had received the gift of song from heaven, he became a monk; and having the Scriptures expounded to him, he turned them into beautiful verse. Caedmon died in 680, and his body was, according to Malmsbury, found enshrined at Whitby, in the beginning of the twelfth century.

The subjects of the six poems ascribed to Caedmon, which have reached us, are—*The Creation—The Fall of Man—The Flight from Egypt—The Story of Daniel—The Torments of the Damned—and Christ's Ascension and Glory.*

According to Bede, Caedmon wrote some other works which are lost.

At the head of the list of authors, after Caedmon, may be mentioned, the venerable Bede (died 735); but as the writings of these men were chiefly in Latin, there is no necessity to particularise their works.

The illustrious Alfred (born 848) stands next in order as a writer in Anglo-Saxon. He translated several Latin works, including those of Osorius and the venerable Bede, and as he wrote in the West-Saxon dialect, it took from this time a preponderance over all others. After Alfred, the most prominent place in Saxon litera-

ture is occupied by Alfric, Archbishop of Canterbury, (died 1006), who prided himself that he wrote Anglo-Saxon pure and simple, avoiding all obscure words, so that he might be understood by unlettered people.

At that period, and during half a century afterwards, the Anglo-Saxon was the prevailing idiom in England, presenting the apparent anomaly of the conquerors imposing their language on the conquered. But the departure from the general rule is sufficiently explained when it is considered that the greater portion of the original inhabitants had not only been conquered, but driven out of the country.

Breaking-up of the Anglo-Saxon Idiom.

The formation of the compound language, known by the name of English, is generally dated from the time of William the Conqueror, although the thin end of the Anglo-Norman wedge had already been inserted into the English tongue by Edward the Confessor, who, on his return from exile in 1042, introduced both the customs and many expressions of the Norman nobles.

No sooner, say our historians, had William the Conqueror, in 1066, taken full possession of England, than he determined not only to change the customs and manners, but the very language of his people. His nobles despised and refused to learn the Anglo-Saxon tongue, "which they abhorred with such intensity, that the laws of the land and the statutes of the English kings were treated of in the Latin tongue; and even in the very

schools, the rudiments of grammar were imparted to the children in French and not in English."*

Ingulph's authority has, however, been so much shaken by the researches of modern investigators that his chronicle is, by Sir F. Palgrave, treated as a monkish invention, while Mr. Thomas Wright goes so far as to consider even the continuation of it by Pierre de Blois, spurious.

Granting that it is not proved that William made a deliberate attempt to change the Anglo-Saxon, or that he banished it from schools, it is certain that the Norman nobles despised, and for a long time did not learn the Anglo-Saxon language. Richard Cœur de Lion understood not a word of a speech addressed to him by his Anglo-Saxon subjects; the higher classes were ashamed to employ the Saxon tongue, and the people began to neglect its niceties.

The first effect which the Norman-French produced on the Anglo-Saxon was on the inflections, for in its original state the Anglo-Saxon was synthetic—that is, as already explained, expressing relations by changing the forms of the nouns, verbs, &c , instead of as at present by means of particles and auxiliary words.

The name given to the language in this transition state is Semi-Saxon. "We can trace its progress," observes Mr. Wright,† "in several literary monuments of importance. The latter years of the Anglo-Saxon

* Ingulph's *Chronicle of the Abbey of Croyland*, translated by H. T. Riley, B. B. Bohn, 1854.

† See an interesting lecture on the *History of the English Language*, delivered in Liverpool before the Historic Society of Lancashire, by Thomas Wright, F.S.A. Brakell, Liverpool.

chronicle, which was continued to 1145, exhibit the language as already breaking very fast; in the *Metrical Chronicle of Layamon*, and in the Metrical Harmony of the Gospels, called the Ormulum, which were both probably written in the closing years of the twelfth century, the Anglo-Saxon grammatical forms have undergone an entire change, which is still more complete in the Semi-Saxon text of the *Regulæ Inclusarum*, or the rule of nuns, in the earlier half of the thirteenth century."

It took, however, a considerable time—and it was not before the middle of the thirteenth century, under Henry the Third, that the French-Norman words were freely admitted into the vocabulary of the people. Old words now became obsolete, and dropped out of the language as worn out teeth from the receding gums.

New terms, chiefly Norman-French, replaced the old ones, until, about the beginning of the fourteenth century, the transformation of the Anglo-Saxon into English was effected.

About that period, that is after the baron's war, the language no longer Semi-Saxon, but English, re-appeared at court, and became an important branch of education among the aristocracy.

The following passages, extracted from Trevisa's translation of *Higden's Polychronicon* are interesting in their bearing upon the dis- and re-appearance of the *birthe tonge*.

"This apayringe of the birthe tonge is by cause of tweye thinges: oon is for children in scole azenes the usage and maner of all other naciouns, beth compelled

for to leve her owne language, and for to constrewe her lessons and her thingis a Frenche, and haveth siththe that the Normans came first into England."

"Now the zere of our Lord a thousand thre hundred foure score and fyve of the secunde King Rychard in alle the gramer scoles of England children leveth French and constreuth and lerneth an Englisch, and haveth thereby avauntage in oon side and desavauntage in another."

In 1362 the English language obtained an important victory by an act passed that henceforth "all pleas in the courts should be pleaded, showed, defended, amended, debated, and judged in the English tongue." Some are of opinion that this important statute was granted on a petition of the people; others consider that it was a free act of grace on the part of Edward the Third, who had just entered his fiftieth year. The ostensible reason given, was, that the French tongue had "become too much unknown in the realm."

This was the age in which appeared the poems of Chaucer, and the celebrated visions of Piers Ploughman, popularly representing doctrines tending towards the approaching reformation. Besides the different form of versification there are very few French words in Pierce Ploughman, compared with the poems of Chaucer, whom Spenser nevertheless called a "well of English undefiled."

From that period of time our language underwent many alterations, until it reached its full development, as exhibited in the authorised version of the Bible and the works of Shakspere.

THE LORD'S PRAYER.

GOTHIC. IN ULPHILAS, About 360.	ANGLO-SAXON.* About 875.	METRICAL VERSION.† 1156.
Atta unsar, thu in himinam.	Fæder ure thu the earth on hoefenum	Ure Fadyr in Heavenrich,
Veihna namo thein.	Si thin namo gehalgod.	Thy name be hallyed ever lich:
Quimai thiudinassus theins.	To be cume thin rice,	Thou bring us thy michell blisse,
Vairthai vilja theins, sve in himina, jah ana airthai.	Gewurthe thin willa in eorthan swa swa on heofnum.	Als hit in Heaven y-do Evar in Yearth been it also:
Hlaif unsarana thana sinteinan gif uns himma daga	Urne gedæghwanlican hlaf syle us to dæg.	That holy bread that lasteth ay,
Jah aflet uns thatei skulans sijaima, swasve jah weis afletam thaim skulam unsaraim.	And forgyf us ure gyltas, swa swa ve forgywath urum gyltendum.	Thou send it ous this ilke day. Forgive ous all that we have don, As we forgivet uch other mon:
Ja ni briggais uns in fraistubnja.	And ne gelaedde thu us on costnung.	Ne let ous fall into no founding,
Ak lausei uns af thamma ubilin.	Ac alyse us of yfle.	Ac shield ous fro the fowle thing.
Unte theina ist thiudangardi, yah mahts jah vulthus in aivins.		Amen.
Amen.		

* Said to have been translated by King Alfred.

† This version, turned into meter, that the people might more easily learn and remember it, was sent over by Pope Adrian, an Englishman. — Wilkin's *Essay towards a Real Character*. 1668.

THE LORD'S PRAYER.

ANGLO-SAXON. About 1160.	TIME OF WICKLIFF, About 1370.	AUTHORISED VERSION. 1600.
Ure Fader thu the on heofene eart	Our Fadyr, that art in hevenes.	Our father, which art in heaven.
Sy thin name gehaleged	Halewid be thi name.	Hallowed be thy name.
To cume thin rice	Thi kyngdom come to.	Thy kingdom come.
Geworde thin wille in heofene and in eorthe.	Be thi wil done in erthe as in hevene.	Thy will be done in earth, as it is in heaven.
Syle us to daig urne daighwamliche hlaf.	Give us this day our bread ovir other substaunce.	Give us this day our daily bread.
And forgyf us ure geltes swa we forgyfath aelcen thare the with us agylteth	And forgive to us our dettis, as we forgiven to oure dettouris.	And forgive us our trespasses, as we forgive them that trespass against us.
And ne laed thu us on costnunge.	And lede us not into temptacioun.	And lead us not into temptation.
Ac alys us fram yfele.	But delyvere us from yvel. Amen.*	But deliver us from evil. Amen.

* Anglo-Norman words are now inserted, whereas there were none before.

Present state of the English Language.

Although our language did not, after the appearance of the Bible version and the writings of Shakespeare, suffer any violent change, still the slow march of Time has not failed to produce in it various alterations, owing to the advancement of learning and the progress of science.

An attentive reader of modern English words cannot help observing the differences which authors exhibit with regard to the proportion of Teutonic or Græco-Latin words which they employ. An examination of passages taken from the Bible and the writings of various authors is stated to have led to the following results:—

The translators of the Bible used for one hundred words of Teutonic origin 5 of Romance;* Shakespere, Swift, and Cowley about 15; Spenser, Milton, Thomson and Addison 22; Locke and Young 27; Robertson and Pope more than 40: and Hume and Gibbon from 50 to 60.

Is this departure of our language from the Bible-standard a sign of degeneration? Many think so, and deplore that the pure well of English has been rendered turbid by so many foreign admixtures; for whatever differences of opinion may prevail as to the accuracy of the authorised version, all denominations are agreed as to the surpassing beauty of the language employed.

"Who will say," writes the Rev. Mr. Faber (*Lives*

* *Romance* is here used as a generic term, designating all words originally derived from the Latin.

of the Saints), "that the uncommon beauty and marvellous English of the Protestant Bible is not one of the great strongholds of heresy in this country? It lives in the ear like music that can never be forgotten, like the sound of church bells. Its felicities often seem to be almost things rather than words. It is part of the national mind and the author of national seriousness."

Again there is a marvellous book found in every cottage, in which there are no "big words," and that is old Bunyan.

"Bunyan's style," says Lord Macaulay, "is delightful to every reader, and invaluable as a study to every person who wishes to obtain a wide command of the English language * * * * Several pages do not contain a single word of more than two syllables, and yet for magnificence, for pathos, for vehement exhortation, for subtle disquisition, for every purpose of the poet, the orator, and the divine, his homely dialect was perfectly sufficient. There is no book in our literature which shows so well as the *Pilgrim's Progress* how rich that language is in its own wealth, and how little it has improved by all it has borrowed."

Johnson is frequently accused of having introduced into our language many new words of Latin origin. The reproach is scarcely merited. Johnson was too rigid a conservative to have been a word-coiner.* All

* "I have attempted a few alterations, and among those few, perhaps, the greater part is from the modern to the ancient practice. * * * There is in constancy and stability a general and lasting advantage, which will always overbalance the slow improvements of gradual correction."—Dr. Johnson's *Preface to his Dictionary.*

the Roman words which he employed were already existing in our language; but he may be safely charged with having acted the part of a resurrectionist in drawing them forth from the oblivion into which many words had already sunk, and by employing them to have given an undue predominance to the Roman element.

There can, indeed, be no doubt as to the fact that nearly all the new materials which have been added to our language for a long time past, have not been drawn from its own native spring, but from a foreign soil. So much have we become accustomed to this importation from certain quarters only, that any new term, if derived from the French, Latin, or Greek, though at first grumbled at, (*e. g.* telegram) soon obtains what the Germans call its citizenship, while it nearly requires an Act of Parliament to naturalise a new Teutonic term, however convenient or expressive. The reason usually given that the terms used in philosophy, science, and art, could not be drawn from the language of the Anglo-Saxons, who had not cultivated them, is refuted at once by the richness of the German language in all technical expressions which we invariably derive from Græco-Latin sources.*

The cause of this tendency obviously was that with the revival of learning and the progress of science the study of the Anglo-Saxon was greatly neglected and sacrificed for that of the classical tongues.

With regard to the actual proportion of the foreign

* The terms oxygen, hydrogen, carbon, are for instance rendered in German, *sauerstoff*, *wasserstoff*, *kohlenstoff*; literally translated, sourstuff, waterstuff, coalstuff.

to the native element in our language the authorities greatly differ. The oldest statement is that of Hickes, that the foreign part amounts only to one-tenth of the whole, founding his conclusions on the version of the Bible, and especially on that of the Lord's Prayer, in which there are but six words not of English origin. Sharon Turner calculates that the foreign elements amount to one-fifth, while other writers contend that the Anglo-Saxon portion of our language is much overrated.

The subject has, however, been thoroughly investigated by Dr. Thommerel,* who, as he expresses himself, took an *inventory* of the whole language, in order to arrive at the truth. Instead of founding his conclusions, like his predecessors, upon selected passages, he carefully, with the assistance of Webster's, Bosworth's, Meidinger's, and the Highland Society's Dictionaries, examined all the 43,566 words comprised in Richardson.

The following are the results of his investigations.

Anglo-Saxon words, 12,098; Islandic, 2; German, 342; Dutch, 712; Danish, 19; Swedish, 57; Greek, 330; Latin, 4,507; French, 8,489; Græco-French, 549; Græco-Latin, 237; Franco-Latin, 13,514; French-Græco-Latin, 195; Italian, 121; Spanish, 48; Portuguese, 6; Celtic, 88; Semitic, 40; Chinese, 1.

The general résumé stands thus :—Of uncertain origin, 294; Teutonic, 13,330; Græco-Latin, 29,854; Celtic, &c., 88; Total, 43,566.

* Recherches sur la fusion du Franco-Normand et de L'Anglo-Saxon. Paris, 1841.

There is, however, a great difference in the relative proportions of Roman and Teutonic words, as found under the different letters. Thus, of the words beginning with *a* 2230 are considered of Roman, and only 392 of Teutonic origin, while in *w* 824 are Teutonic, and only 81 Roman.

According to this statement, it would appear that the native element constitutes only one-third of our present language—a result somewhat unexpected, but probably, not far from the actual truth.

Has then, after this, the English language a right to be called a Teutonic tongue? Undoubtedly; for this third is its vital part, without which it would cease to exist; as all the foreign materials will not enable it to join together even two words or two verbs.

It must, however, not be assumed that the 43,000 or 44,000 words found in the dictionary, constitute the whole vocabulary of our language, for it may be fairly calculated that if the many compound and floating expressions, only now and then used, are added, the number of words would be raised to above 80,000. Of these, it may perhaps be above the mark to say that 20,000 only are used in literary compositions, while, probably, not one-eighth of them are employed in colloquial intercourse. There is also a considerable difference with regard to the number of Teutonic and Romance terms used in our written and spoken language. In the former, one-half of the words will mostly be found to be of foreign extraction, whilst in the latter, three-fourths, at least, are home-grown.

Most of the words made use of in conversation are

Anglo-Saxon, and it will be observed that while the generic terms in the following list are French or Latin, the individuals comprised in them are Saxon.

Universe —Sun, moon, stars, &c.
Globe.—Earth, land, sea, water, stream, fields, meadows, hill, dale, wood, oak, birch, beech, elm, ash, &c.
Time.—Day, night, noon, midnight, morning, evening, year, month, week, &c.
Natural Phenomena.—Thunder, lightning, rain, snow, hail, sleet, wind, storm, heat, cold, frost, &c.
Animal.—Man, fish, bird, worm, ox, cow, heifer, calf, swine, stag, doe, hart, sheep,* lamb, wolf, fox, hare, &c.
Organs.—Eye, mouth, lip, tooth, tongue, heart, lungs, &c.
Functions.—To eat, to drink, to sleep, to breathe, to laugh, &c.
Parts and Members.—Limbs, hand, foot, finger, thumb, thigh, chest, breast, &c.
Position.—To stand, sit, lie, &c.
Motion.—To run, go, walk, leap, spring, fly, swim, creep, slip, crawl, &c.
Commerce.—To trade, buy, sell, lend, borrow, &c.
Products.—Corn, barley, oats, rye, straw, hay, &c.
Domestic Relations.—Father, mother, son, daughter, husband, wife, child, bride, friend, roof, hearth, fireside, home, &c.
Emotions.—Hope, fear, love, sorrow, hatred, scorn.
Sound.—To hiss, buzz, hum, crack, smash, &c.
Colour.—White, black, yellow, green, red, brown.
Number.—All the numerals, excepting second, and million, billion, &c., are Teutonic.

Opinions may differ with regard to the loss which the English tongue has experienced in originality and quaintness, but it is incontestable that not only has our vocabulary been vastly increased by foreign impor-

* When dressed up, the ox becomes the Norman-French *beef;* sheep, *mutton*; calf, *veal;* swine, *pork;* hart, *venison.*

tations, but we have been furnished with a great variety of new expressions and synonymes. Romance words greatly come to our relief, when, in refined society, we have to express certain ideas which require to be softened down. Honest and naked Saxon terms, descriptive of certain acts and objects, are only rendered admissible into the drawing-room by being dressed up in a Greek or Latin tunic. Thus, the whole vocabulary of the physician being nearly of Romance extraction, his terms give no offence to ears polite.

Still the vital power of the Saxon portion of our language is shown by the fact of its having not merely survived, but preserved its ascendency, in spite of all the revolutions it has undergone.

"Trampled down by the ignoble feet of strangers, its spring still retains force enough to restore itself; it lives and plays through all the veins of the language, it impregnates the innumerable strangers entering its dominions with its temper, and stains them with its colour; not unlike the Greek, which, in taking up oriental words, stripped them of their foreign costume, and bid them appear as Greeks." *

Excellences of the English Language.

Not only is the actual English vocabulary as large, or perhaps larger than that of any modern tongue, but the very loss of a portion of its originality has rendered the language capable of appropriating with

* Bosworth's *Anglo-Saxon Dictionary.*

impunity the spoils, power, and beauty from almost any language, so that we possess a never failing supply of new terms whenever they are wanted. Then again, the order in which our words are arranged, is simple and logical. We are not like our German cousins, obliged to keep a sharp look out for the verb which may be at the bottom of the page, whilst the subject stands at the top; nor need we look into the dictionary whether table be masculine, feminine, or neuter. No declensions of substantives, adjectives, and participles; few variations in our tenses, and but a small number of irregular verbs.

Surely these are great advantages, and render our grammar the easiest of all known languages.

The following character, given to the English tongue, nearly three centuries ago, has certainly not been forfeited.

"The Italian is pleasant, but without sinews, as a still, fleeting water. The French delicate, but even nice as a woman, scarce daring to open her lips for fear of marring her countenance. The Spanish majestical, but fulsome, running too much on the *o*, and terrible, like the devil in a play. The Dutch, manlike, but withal very harsh, as one ready at every word to pick a quarrel. Now we, in borrowing from them, give the strength of consonants to the Italian; the full sounds of words to the French; the variety of terminations to the Spanish; and the mollifying of more vowels to the Dutch; and so, (like bees), we gather the honey of their good properties, and leave the dregs to themselves. And thus substantialness combineth

with delightfulness, fulness with fineness, seemliness with portliness, and currentness with staidness, how can the language which consisteth of all these, sound other than full of all sweetness?"*

A brilliant living author thus endorses old Camden's testimonial:—

"Then was formed that language, less musical, indeed, than the languages of the south, but in force, in richness, in aptitude for all the highest purposes of the poet, the philosopher, and the orator, inferior to that of Greece alone."—*Lord Macaulay's History of England.*

As modern philology is gradually abandoning the theory that the beauty, wealth, and force of a language depends on the complication of its grammar, the richness of inflections and its structural niceties, Macaulay's exception in favour of the Greek, is by no means unexceptionally granted.

But lest it be deemed that the foregoing observations on the excellencies of our noble tongue are rather too partial, let the reader peruse the following opinions entertained by foreign authorities of high repute.

"Of all languages," says the Abbé Sicard, "the English is the most simple, the most rational, and the most natural in its construction. * * * No language seems better calculated to facilitate the intercourse of mankind as a universal medium of communication."

But there is, perhaps, no living writer who possesses a greater right to pass a judgment on our language, than Jacob Grimm, the author of the *Deutsche Grammatik*, which has proved such a mine of wealth to our

* *Camden's Remains*, page 56, seventh impression.

own linguists; and he expresses himself to the following effect:—

"The English language possesses a power which probably never stood at the command of any other nation. This singularly happy development and condition has been the result of an intimate union of two of the noblest languages, the Teutonic and the Romance; the former supplying the material ground work, the latter the spiritual conceptions. In truth, the English language, which by no mere accident has produced and upborne the greatest and most predominant poet of modern times, (I can, of course, only mean Shakespeare) may with all right be called a world language; and like the English people, appears destined hereafter to prevail with a sway more extensive than its present one, over all portions of the globe. For in wealth, good sense, and closeness of structure, no other of the languages at this day spoken deserves to be compared with it—not even our own German, which is torn even as we are torn, and must rid itself of its defects, before it can enter into the lists as a competitor with English."

CHAPTER XIV.

ORIGIN AND PROGRESS

OF

WRITING.

WHATSOEVER advantages audible language may confer upon man, as a medium of communication with his fellow creatures, it is clear that, save for some contrivance to fix the evanescent sounds, the intercourse of human beings must have remained very limited, and the greater part of the acts and thoughts of past generations must have been lost. Hence, in tracing the history of the human race, we can scarcely point out any people, how low soever in the scale of civilization, who have not felt the necessity of contriving and employing, besides their vocal organs, some other means of expressing their thoughts and feelings.

The mode devised to give some permanency to the fleeting sounds has been to address the eye instead of

the ear. Writing and visible language are thus convertible terms. But—

> "Whence did the wondrous mystic art arise,
> Of painting speech, and speaking to the eyes,
> That we, by tracing magic lines, are taught
> How both to colour and embody thought?"*

That a small number of elementary characters should represent such a world of thought, feeling, and experience; that the tradition and civilisation of all nations which inhabited the earth should be reflected in it as in a mirror; and that it should form a chain of communication from the remotest period, until the present moment, seems so marvellous, that, like the origin of language, the alphabet was considered to be of divine origin.

Gilbert Wakefield concludes his *Essay on the Origin of Alphabetical Characters* with the following remarks:—

"To suppose that the art of alphabetical writing is the invention of man, is almost a philosophical impossibility, when we consider that it must, in this case, have been devised in the rudest state of the human intellect, while *typography*, a discovery less curious and sagacious, eluded the detection of the most refined ages of literary perfection."

* "C'est de lui qui nous vient cet art ingenieux,
De peindre la parole, et de parler aux yeux,
Et par les traits divers des figures tracées,
Donner de la couleur et du corp aux pensées?"
Brebeuf's Translation of Lucan's Pharsalia.

The conjecture that the decalogue was the first specimen of alphabetical writing, and that a knowledge of letters was communicated to Moses by God, is unfounded, as in the passage, "And the Lord said unto Moses, write this for a memorial," (Exodus xvii. 14) the command sufficiently indicates that the art must have been sufficiently known. There is another passage to be found in the Book of Job, who, according to Dr. Hales, lived in the patriarchal age, 184 years before Abraham, and which runs thus:—

"Oh that my words were now written! Oh that they were *printed* in a book!

"That they were graven with an iron pen and lead in the rock for ever."—Chap. xix. 23 & 24.

In short the principal modes of giving permanency to thought are mentioned in these verses. It is, however, justly surmised that the word *printed* is a mistranslation, and that *traced* is the proper meaning of the original term. Philo attributes the invention of letters to Abraham. Seyffarth even fixed the date of the invention, which, according to him, was conceived by Noah, on the 7th of September, 3446 B.C., upon the Zodiacus and the constellation of the seven planets.

The learned Theod. Bibliander is generally mentioned in books of reference, as having satisfactorily (to himself) traced the invention to Adam. This opinion must, however, have been prevalent centuries before Bibliander's time, as proved by the following passage extracted from *Capgrave's Chronicle*:—

"Anno mundi centesimo."

"We rede that Adam in his first beginning, named

all bestes and foules upon erthe, and that same name that thei have in the Hebrew tonge, he gave it to them. Eke (also) we rede that he prophecied both of the flood that schuld destroye the world, and eke of the fire, *therefor he wrote these prophecies in too pileres, on of brasse, whech schuld not be distroyed with watir, a nothir on tyl, which schuld not brenne with fire.*"*

Plato, Diodorus Siculus, Cicero, and other profane writers, ascribe the invention to the gods, especially to the fifth Mercury, or Hermes, called by the Egyptians, Thoth.

Discarding, however, both the fiction of the priests and the dreams of enthusiasts, we cannot but come to the conclusion, that the art of writing is like language, the result of human thought based upon human instinct.

Considering the exquisite structure of man's hand in combination with the imitative faculty inherent in human nature; it is almost impossible to imagine the existence of a tribe possessing neither the disposition nor the power to represent, however rudely, the figures of external objects.

It is, therefore, but natural to suppose that the first expedient which man adopted to render somewhat permanent, or to recall to other minds both objects and acts, was to give to the best of his ability actual delineations of them. Thus the figures of a man and a club

* *Capgrave's Chronicle*, edited by the Rev. Ch. Hingeston, B.A., published by authority. John Capgrave, according to his own account, was born in 1393, died 1464. "If ye will wete what that I am, my cuntre is Northfolk of the toun of Lynne."

would, separately, be simply a representation of the actual objects, while the club in the hand of a man might be the elementary symbol for an act.

But with the increase of knowledge it was found necessary to describe, not only objects and acts, but qualities and ideas; and these could only be represented visibly by objects having or supposed to have some analogy to the ideas intended to express. Thus arose symbolical writing, the most difficult to decipher, as the analogy between the original idea and the object represented was frequently merely imaginary or the result of local associations.

These representations increased with the advance of civilisation to such an extent that it became necessary greatly to abridge them, and to leave only such prominent parts as might suggest the whole or express the species. The symbol thus gradually lost all resemblance to its original, until it became at last scarcely recognisable.

The last stage in the development of writing is the *Phonetic*, in which certain characters are made to represent syllables or entire words, and which led to the most valuable of human inventions, the alphabet.

American Picture-Writing.

Most of the records which have reached us, furnish abundant evidence in favour of the theory just advanced. Picture-writing existed in primitive ages among all but the lowest savages, and is even still in use among some of the Indian tribes in North America.

The following interesting passages, in reference to this subject, are extracted from the great national work on the Indian tribes, now publishing by authority of Congress.*

"For their pictorial signs, the North American Indians have two terms, namely, *kekeewin*, or such things as are generally understood by the tribe; and *kekeenowin*, or teachings of the *medas*, or priests, and *josskeeds*, or prophets. The knowledge of the latter is chiefly confined to persons versed in their system of magic, medicine, or religion, and may be termed the *hieratic*. The former consists of the common hieratic signs, such as are employed at places of sepulture, or by hunting or travelling parties. It is also employed in the *muzzinabilis*, or rock writing.

"One of the most obvious devices of the primitive ages in picture-writing would appear to have been a personal device, or mark to stand as a sign of a name; and hence we find that seals and signets were used long before letters.

"Thus among the Indians, the 'Totem,' (armorial badge,) is a symbol of the name of the progenitor—generally some quadruped or bird, which stands, as it were, as the surname of the family. By whatever names the individuals who trace from it their lineage may be called, it is the *totem*, and not their personal names, which are recorded on the tomb.

"The turtle, the bear, and the wolf, appear to have

* *Historical and Statistical Information respecting the History, Condition, and Prospects of the Indian tribes of the United States*, collected, &c., by H. R. Schoolcraft, L.L.D. Philadelphia.

been primary and honoured totems in most of the tribes, and bear a significant rank in the traditions of the Iroquois and Lenapis, or Delawares; and they are believed to have more or less prominency in the genealogies of all the tribes, who are organised on the totemic principle.

"The turtle is an object held in great respect in all Indian reminiscence. It is believed to be a symbol of the earth, and is addressed as a mother."

Mexican Picture-Writing.

When the Spaniards arrived in Mexico, they found many persons engaged in picture-writing, and a great quantity of manuscripts and paintings.* As these scrolls were, however, looked upon by them as devilish devices, all those that could be collected were, by the order of the first Archbishop of Mexico, publicly burned. Some few, however, of these manuscripts have found their way into the European libraries. One of the most interesting of them is that sent to Charles the Fifth, by the Viceroy Mendoza, and hence called the *Mendoza Codex*, which, after undergoing various vicissitudes, obtained at last a resting place in the Bodleian Library, at Oxford.

According to the Marquis Spineto, the original is in the Escurial. The work embraces a history of the Mexican Empire, under its ten monarchs, a tribute

* Montezuma was informed of the arrival of Cortes by sketches of the Spaniards, their ships, horses, arms, &c.

roll and a code of their institutions. The antiquary Purchas published this document in the third volume of his *Pilgrimage*, in 1625.

Egyptian Writing.

Hieroglyphics (sacred engraving).—There can be but little doubt the writing of the Egyptians also originated from iconographic or picture-writing.

The earliest hieroglyphics known are those found in the tombs near the Pyramids of El Geezeh, and were executed about 2440 B.C., in the beginning of the fourth dynasty. In these inscriptions, many of which have been published,* there is a combination of picture and phonetic writing. Both Bunsen and Lepsius consider that these inscriptions were executed about a thousand years earlier.

The Egyptian writing consisted of three kinds of characters—the *hieroglyphic*, the *hieratic*, and the *demotic*, or *enchorial* characters.

The hieroglyphic characters either represent real things by pictures, or ideal things by symbols; while some characters, either syllabic or alphabetic, represent sound phonetically.

The hieratic character seems to have been used not long after the hieroglyphic, to which it bears the same relation as written to printed matter.

The demotic or *enchorial* (vulgar) characters are altered forms of the hieratic, and are ruder in form.

* See Lepsius Denkmäler aus Aegypten und Aethiopien.

The vulgar dialect is expressed in this system, in which the phonetic characters greatly predominate over the iconographic and symbolic.

The discovery of the Rosetta stone, although it may not have realised the hopes entertained that by its means we should be enabled easily to decipher all the Egyptian monuments, must certainly be considered as having given a powerful impulse to Egyptian researches. This piece of black basalt, was found in the ruins of Fort St. Julien, near the Rosetta Mouth of the Nile. The British took possession of it on the capitulation of Alexandria. It was brought to England in 1802, and is now in the British Museum

Three inscriptions are found on this stone. That on the top is in hieroglyphic, the second is in enchorial, and the third is in Greek characters. A considerable portion of the hieroglyphic inscription is broken off; from the enchorial description consisting of thirty-two lines, the beginning of the first fifteen is wanting, but the Greek text is least mutilated.

The stone, as appears from the Greek inscription, was erected about 197 B.C. in the ninth year of the reign of Ptolomaeus Epiphanes. Porson and Heyne furnished translations of the Greek text, which, being a decree in honour of Ptolemy, concludes with these words:—"This decree shall be engraven on a hard stone in sacred, common, and Greek characters."

But although the Greek does not faithfully represent the enchorial text, but only gives its meaning, it afforded to inquirers a certain basis. In addition to this must be mentioned the favourable circumstance that the

beginning of the inscription contained many proper names, which are less liable to change in different languages, and which can always be more easily recognised in unknown characters.

These proper names, as Dr. Thomas Young was one of the first to detect, are on most Egyptian monuments distinguished by being enclosed in an oval ring, called a royal *cartouche.* Dr. Young was also one of the first to discover that the hieroglyphics were not merely representatives of things, but also of sounds, and were thus used both as symbols, and as phonetic characters. Among successful decipherers of hieroglyphics must also be mentioned Sylvester de Sacy, Akerblad, and especially Champollion. Lepsius and Bunsen deservedly rank high as investigators of Egyptian antiquities.

A modification of picture-writing, in which the emblems were, like some of the hieroglyphic characters, both representatives of objects and articulate sounds, was revived a few centuries ago, and soon became a favourite amusement in France and in England. This style of writing was called *Rebus*,* and William Camden gives the following account of its introduction into England.

"After that the triumphant victorious king Edward the Third had traversed France, and had planted English colonies

* The name is, according to Menage, derived from certain tracts which the priests of Picardy issued annually about Carnival time, for the purpose of exposing the intrigues that had passed in their neighbourhood. These pamphlets were entitled *De rebus quæ geruntur;* the breakings and joinings of the words were filled up with pictures. Children's books are sometimes arranged on this principle, and the *Rebus* is still a standing feature in many continental publications, especially French.

in Calice, Hammes, and Guynes, our people bordering upon the pregnant *Picardes* began to admire their fooleries in painted poesies. For whereas a poesie is a speaking picture, and a picture is a speechless poesie, they which lack'd wit to express their conceit in speech, did use to depaint it out (as it were) in pictures, which they called Rebus by a *Latine* name well fitting their device.

"They were so well liked by all degrees, the learned and unlearned, that he was nobody that could not hammer out of his name an invention by this wit-craft, and picture it accordingly.

"Did not that amorous youth mystically express his love to *Rose Hill*, whom he courted, when, in the border of his painted cloth, he caused to be painted as rudely as he devised grossly, a Rose, an Hill, an Eye, a Loaf, and a Well? That is, if you will spell it, *Rose Hill I love well.*

"Morton, Archbishop of Canterbury, a man of great wisdom, and born to the universal good of the realm, used a mulberry tree, called *morus* in *Latine*, out of a tun. So Luton, Thorneton, Ashton, did notify their names with a lute, a thorn, an ash upon a tun. So an hare on a bottle, for Harebottle; a magpie on a goat, for Pigot."*

Assyrian and Babylonian Characters.

Not less interesting than the hieroglyphics in their bearing both on Ethnology, and on sacred and profane history, are the arrow headed or wedge shaped inscriptions found engraven upon the bricks, buildings, rocks, and monuments in Babylonia, Persepolis, Hamadan, Van, Behistan, in short, spread throughout the mighty empire of the great Cyrus. These inscriptions are now familiar to the eye of the public from the

* *Camden's Remains*, p. 215.

numerous slabs and monuments which, thanks to the discoveries of Layard, have found their way to the British Museum. Like the hieroglyphics, the cuneiform inscriptions were, by the very descendants of the people who engraved them, imagined to be the work of spirits, and like the hieroglyphics, they at last revealed their secrets to the magic touch of the philologists of the nineteenth century—pre-eminently the age of inventions and discoveries. Pietro della Valle (*Voyage Paris*, 1747), and Figuero, Ambassador to the Court of Spain, are mentioned as the first European travellers who formed any conjectures as to the interpretation of cuneiform characters. The first exact copies of arrow headed characters were published by Niebuhr on his return from the East, which, no doubt, gave rise to various attempts to decipher them. Dr. Hager, in a dissertation published in 1801, gave it as his opinion that the character on bricks indicated the brick maker's name. Hager was followed by Lichtenstein, who refers the inscriptions in the ruins of Babylon to the seventh century after Christ, and asserted that the inscriptions must be read from right to left.

As about the time when these inscriptions were engraven, three distinct nations, Assyrians, Persians, and Scythians, speaking different languages, inhabited these regions, the inscriptions are trilingual: Persian, Assyrian, and a third which is not yet decipered.

Just as the Greek text on the Rosetta stone furnished the key for deciphering the hieroglyphics, so was the Assyrian alphabet constructed out of the Persian text.

To the late Dr. Grotefend, of Hanover, belongs, how-

ever, the merit of having laid the foundation for all subsequent discoveries. Already in 1802 Grotefeud read a paper on cuneiform inscriptions before the literary society of Goettingen in which he gave the following as the results of his investigations :—

"That the cuneiform figures are alphabetic characters.

"That the inscriptions of Persepolis contain three different systems, so that the deciphering of one would furnish the sense of the other.

"That the inscriptions are to be read from left to right.

"That the Persepolitan inscriptions are in Zend, and belong to the period of Cyrus and Alexander."

A basis for future labours had now been laid. In 1826 Bournouf possessing an intimate knowledge of the Zend language, ascertained that one of the Persepolitan inscriptions contained numerous proper names of ten syllables, of which he was able to fix the reading, and thus augmented the alphabet, and proved that a knowledge of Zend and Sancrit, cognate to the old language of Persia may be successfully applied in deciphering the characters.

Professor Lassen, of Bonn, a pupil of August Schlegel, published at the same time a most important work * on this subject which supplied twelve new letters hitherto misunderstood

The largest and most important record of the Persian state and the might of Darius, is the Behistan

* *Die Alt-Persischen Keil-Inschriften von Persepolis.* Bonn 1836.

inscription, from which Sir H. Rawlinson picked out his Assyrian, and which he could now read in the Persian cuneiform writing so as to enable him to construct a pretty accurate Assyrian alphabet, which he found was nearly allied to the ancient Chaldee and Hebrew.

This inscription is engraven on a rock, at a place called by Sir H. Rawlinson, Behistan (but marked in the maps Bisutun), not far from Kirmanshah, or the frontier of Persia. The rock rises abruptly from the plain to the height of 1,700 feet, and the inscription is engraven at an elevation of 300 feet above the plain, by which the monument has been spared the fate which has befallen other ancient records. The execution of these inscriptions for extent, beauty, and uniformity is really wonderful, especially when we take into account that it was executed in an age where steel was supposed to be unknown.* In this inscription occurs the following passage, standing over the head of the effigy of the monarch, which is thus interpreted by Sir H. Rawlinson.

"Says Darius the king, 'My father was Hystaspes, the father of Hystaspes was Arsames, the father of Arsames was Aryaramnes, the father of Aryaramnes was Teispes, the father of Teispes was Achaemenes. On that account we have been called Achaemenes."

At the meeting of the British Association, in 1850, Sir H. Rawlinson, in reply to some observations by Dr. Hinks, said that he doubted whether they could trace, in the Babylonian inscription, the primitive

* See Rawlinson's account of his progress in the 10th vol. of the *Royal Asiatic Journal.*

civilization of man. He was of opinion that civilization first showed itself on the Nile after the inauguration of the early tribes from Asia. In Egypt, he thought, germinated the human intellect, and that there was, in a later age, a reflux of civilisation from the Nile back to Asia. He was satisfied that the system of writing in use on the Tigris and Euphrates was taken from the Nile. The earliest Assyrian inscriptions found by Mr. Layard at Nimroud, and which that writer believed to be 2500 years older than the Christian era, he was inclined to place between 1350 and 1200, as there was a notice in them of Tyre and Sidon, which were not founded more than 1300 years B.C.

England has good reason to be proud of having given birth to such a *par nobile fratrum* as Layard and Rawlinson—the greatest excavator and the most successful interpreter of by far the most interesting relics of antiquity.

Chinese Writing.

The Chinese characters are not, as those in other languages, representatives of sounds, but symbols of ideas, addressing the eye and not the ear, resembling, in some respects, numbers and algebraic notations which various nations can understand, though they pronounce them differently. Thus, although the oral languages of the various territories of the Chinese empire differ, the inhabitants of these countries are able to communicate with each other by means of the *Wan-tsze*, or written language, which neither corresponds to the

spoken Mandarin language (Kwan-hwa), nor to the local idiom (Heang-tan).

Dr. Morrison *(Chinese Dictionary)* says that *Paou-she*, a person who lived about the year of the world 2900, is by the Chinese considered as the father of letters, and that nine-tenths of his characters were rude representations of the things signified. These characters are yet found on ancient seals and vases, and show the changes that have taken place from the picture to the symbol. A collection of them is to be found in Père Amiot's *Lettre de Pekin.*

The present system of symbols, consists of a certain number of characters called Tse-poo (directing characters), or shoo-moo (eyes of the book). These characters have received the names of *keys*, elements, or radicals, and amount in number to 214. They are divided into 17 classes, beginning with such keys as are formed of one stroke of the pencil, and ending with those composed of 17 strokes. These keys stand either on the right, on the top, in the middle, or at the bottom, but most frequently on the left side of the character.

The dictionaries are divided into 17 sections, headed by the 17 keys, commencing with that class which has its keys of one stroke and ending with that which is composed of 17 strokes.

The Chinese words are disposed in perpendicular lines one word below the other.

Modes of Writing. The ancient forms of writing, included—1, the vertical or column writing, still practised by the Chinese; 2, the horizontal, either from right to left, or from the left to the right, and 3,

furrow-writing, termed, in Greek, *boustrophedon* ox-turning manner. The writer, who practised the last method, thus saved the time consumed in carrying the hand back to the beginning of the next line, while the eye of the reader is not constrained, on arriving at the end of a line, to hit the commencing point of the next line.

It is probable that the earliest practice was to write from the right to the left. Whether the method of writing from left to right, adopted by the people of the west, be superior, is a mere matter of opinion, every people preferring that mode to which they have been accustomed.

Alphabets.

The term "alphabet," which designates a definite series of characters, is, no doubt, derived directly from the Greek, and indirectly from the Hebrew language, as the *alpha* and *beta* of the Greeks, evidently correspond to the *aleph* and *beth*, the first two letters of the Hebrew alphabet.

The number of letters varies in different languages; thus, whilst the Sanscrit alphabet is composed of fifty characters, the Semitic alphabets have but twenty-two letters. In the European languages again, we find that the Italian alphabet consists only of twenty-one letters, while the Russian has as many as thirty five; indeed, the old Russian has forty-one letters.

In no existing alphabet do the characters perfectly

correspond to the elementary sounds of the respective language. The letters are either redundant or insufficient.

The Russian alphabet, which Cyrillus formed out of the Greek, and enriched with twelve new characters, is considered as one of the most perfect, and might, by means of diacritical marks, be made clearly to express the writable sounds of most languages.

Some authors, like Van Helmont and De Brosses, conceived that letters derived their forms from the position of the organs of articulation; the former endeavoured to prove that the Chaldaic characters approach nearest to the alphabet of nature, and that no letter can be properly sounded without disposing the organs of speech in a position corresponding to the figure of each letter.

There is, however, every probability that the letters composing the Phœnician alphabet, allowed by common consent, to be one of the most ancient which has reached us, represented, at first, real objects, but whether they resembled them in form is less certain.

The following table gives an interpretation of the Hebrew alphabet, according to the researches of Gesenius and Roediger.

I.	Aleph	Bull (head with horns)
II.	Beth	Tent or house
III.	Gimel	Camel (the long neck)
IV.	Daleth	Door (the square form in the original)
V.	He	Lattice window, air hole
VI.	Vav	Hook, nail
VII.	Zain	Weapon lance
VIII.	Khet	Paling
IX.	Zet	Serpent

X.	Jod	Hand with wrist
XI.	Kaph	Hand hollow
XII.	Lamed	Prick stick
XIII.	Mem	Water (the waves)
XIV.	Nun	Fish
XV.	Samech	Brass
XVI.	Ajin	Eye
XVII.	Peh	Mouth (open)
XVIII.	Tsade	Angle, (fishing hook)
XIX.	Coph	Ax
XX.	Resh	Head of bird or man
XXI.	Shin	Tooth
XXII.	Tav. Tau	Sign, brand of beasts

The invention, or at any rate the introduction of an alphabet into Greece, is usually ascribed to Cadmus, a mythological hero, the pretended founder of Thebes. According to some scholars, Cadmus is derived from the Phœnician word *kedem* (morning, orient), and refers to the immigration of a Phœnician tribe into Greece.

The Phœnicians were Canaanites, and Cadmus is said to have lived about the time of Joshua.

The first alphabet which the Greeks received consisted only of sixteen letters, which did not in form much differ from the Samaritan letters. Palamedes, twenty years before the taking of Troy, about 1164 B.C., is said to have added the double letters *theta*, *xi*, *ph*, *chi*, and Simonides *zeta*, *eta*, *psi*, *omega*.*

Runes.

Much mystery was formerly attached to certain peculiar characters chiefly employed by the northern

* Abbé Fourmont says that some of these were used before the days of Palamedes.

nations of Europe. It may therefore not be uninteresting to insert a short account of the Runic alphabet.

The term Runes is derived from the northern word *runa*, signifying letter, speech, song, in a mysterious sense; thus the German word *raunen* means to whisper. Others derive the word from *runen*, to scratch, to engrave.

As all writing originally was engraving, so were the earliest Runes cut on stones, but chiefly engraved upon wooden tablets or sticks. Poetry was frequently inscribed upon quadrangular staves, each face containing a line; hence a verse and a stave are still considered synonymous.* Magical virtues, spells, and charms were ascribed to the Runic characters in the earliest period. The women who occupied themselves with magic and divination were called *alrunen*, and in Sweden a magician was even till the sixteenth century called *runokarl*.

From the apparent similarity of the Runic letters to Greek and Roman characters, Fr. Schlegel and others were of opinion that Phœnician merchants introduced Greek and Roman characters among the northern nations inhabiting the shores of the Baltic, and that the priests kept them secret and modified them by giving them an angular form for the purpose of engraving.

According to others, the greatest part of the northern Runes represent rude hieroglyphics of objects. Runic letters are divided into three classes: the Northern or Scandinavian; the Anglo-Saxon, and the German.

* Buchstabe (beech stave) is still the German name for letter.

The Northern Runic alphabet consisted originally of sixteen letters, each of which had its proper name. The alphabetic arrangement seems arbitrary, no attention having been paid to the affinity of sounds.

NAME.	SIGNIFICATION.
Fe	Sheep. (f)
Ur	Bos taurus, auerochs, urwasser. (u, v, o)
Thorn	Thorn or thurs, giant. (th)
Ob, os	Mouth. o (à)
Reid	Ride or lightning. (r)
Kaun	Bump. (k)
Hagl	Hail. (h)
Naud	Fetters. (a)
Is	Ice. (i j)
Ar	Eagle. (a)
Kne sol	Bent sun. (s z)
Tyr	Hammergod. (t d)
Biarkan or Biörk	Birch. (b p)
Laugr	Bath or sea. (l)
Madr	Man (m.)
Yr	Bow. (y)

This alphabet was divided into three parts: *Fe* led the first six characters, and Hagel and Tyr the remaining ten. They were therefore called Freys-aett (Freis species) Hagls-aett, and Tyr's-aett

It will be perceived that in this alphabet there is but one character for *b* and *p*; one for *g* and *k*; one for *d* and *t*, and one for *u*, *v*, *y*. Besides which, the intermediating vowel *e* is entirely wanting, and is expressed by *i*, *a*, *ia*, and *ai*.

Some of these defects were subsequently removed by the addition of *e*, *g*, *p*, *v*. No particular marks were assigned to these new comers, but old Runes were

selected, bearing to them some affinity in sound, and points added. These Runes are therefore called *stungnar runir*, pointed Runes, and excepting the points consist of the Runes *i*, *k*, *b*, and *f*. On the introduction of Roman writing on parchment and paper, new characters were formed for *dh*, and the diphthongs *æ*, *æ*, *ue*, and even for *c*, *g*, and *z*. The latter are considered spurious.

The greatest number of stones covered with Runic characters are to be found in Sweden. But few of these stones belong to heathen times; several have been found evidently belonging to the beginning of the Christian era, but by far the greater portion are of the eleventh and twelfth century. The oldest known books written in Runic letters, are not older than the beginning of the thirteenth century, and the most recent is one of 1449.

The invading Anglo-Saxons were, therefore, probably not ignorant of letters; for they imported the Runic characters, the invention of which was ascribed to Odin, from whom they were fond of tracing their descent.

On the introduction of the Roman alphabet, by Augustine and his followers, and the conversion of the Saxons, the Runic characters, which were very inconvenient for general writing, were gradually abandoned. The Runes *Thorn* and *Wen*, however, still appeared in the Anglo-Saxon alphabet, as there were no corresponding letters in the Latin alphabet.*

* See *Olaf Worm Literatura Runica*, 1661. *Lilyegren Run Urkunder, Stockholm*, 1833. W. Grimm, *über Deutsche Runen*. Goettingen 1824.

Writing in England.

The monks who came into England with Augustine, at the close of the sixth century, introduced the Roman letters as they were then written, which, excepting the early change from what are called *uncial* letters, were not unlike our modern Roman type. When they were employed in writing the Anglo-Saxon, it was necessary to add to them, from the Anglo-Saxon Runic alphabet, the characters representing *th*, *dh*, and *w*. The Norman monks brought in the Roman characters as they were then written in Normandy, differing in some respects from those hitherto used. From this time, the forms of the letters, and the general character of the writing went through various changes, so that we can judge by this circumstance to what period any manuscript belongs, From this writing we derive the printed characters commonly termed *black letters*, and in French, *lettres Gothiques*. There was, however, a marked difference between the handwriting of the clergy and book scribes, and that of the law writers. The latter was, at a late period, called Chancery-hand. The court-hand, composed of deformed Norman characters, contrived by English lawyers, as was maliciously observed, for the purpose of mystification, continued from the middle of the sixteenth century until the reign of George II., when it was abolished by law.

Leibnitz, in his *Ars Combinatoria*, and several mathematicians after him, as Prestet, Clavius, and Tacquet have endeavoured to calculate the number of words, or combinations that may be made out of twenty four

letters. Although they differ in the results, they agree that to all intents and purposes, the numbers obtained may be said to be infinite, so that Tacquet says, that a thousand millions of scribes could not, in a thousand millions of years, transcribe all the permutations of which twenty-four letters are capable.

Hence we find, that while the number of words is great, the number of letters is comparatively small, and admit, in most languages of being further reduced.

G. Wachter * gives a scheme of ten characters, or letters which he considers sufficient for the purpose of an alphabet. These characters, he observes, although they do not exceed the number of the fingers, suffice to mark the sounds of all languages; as those letters which seem wanting, represent compound sounds, and require no new characters.

Printing.

It would be improper to conclude a chapter on the art of writing without briefly adverting to its marvellous progeny—the art of printing.

If there were seven cities which disputed for the honour of having given birth to Homer, there were not less than seventeen towns of Germany, the Netherlands, and Italy who contended for the glory of having produced the first printer.

The general conclusions arrived at by impartial investigators, after sifting these conflicting claims, may be summed up as follows:—

1. That Laurenz Janszoon, of Haarlem, called,

* *Naturæ et Scripturæ Concordia.* Lips, 1751.

from his office as Sexton, *Coster*, was not merely a skilful and one of the earliest block-book printers,* but that there is some evidence that he also employed moveable types, and if so, must be considered as *one* of the inventors of printing. Much, however, relating to Coster, who, according to some authorities, was born in 1370, and died 1439, is mere tradition, resting chiefly on a narration of Adrian Junius; hence while the Dutch consider him as the sole inventor of printing, others proceeding to the other extremity, look upon Coster as a myth.†

2. That ALBRECHT PFISTER, of Bamberg (born about 1420, died 1470) was one of the earliest and most learned typographers, and that from his office at Bamberg issued a variety of important works; but whether he invented the moveable types for some of his works, or purchased them, cannot be determined as there are no authentic records of his life. The claims of this remarkable man, as one of the inventors of typography are vindicated by T. Jäck in his description of the Public Library at Bamberg.‡

* Printing from engraved or carved blocks of wood has been traced to the playing card makers of Italy, Holland, and Germany, as far back as the middle of the fourteenth century. Religion soon availed herself of the card makers' art; pictures of Saints were produced, accompanied by literary illustrations, and thus by employing a series of blocks, were formed those works known by the name of block-books, which are so highly prized, as they exhibit the art of printing in its infancy. Some beautiful specimens of these block books, well worth the inspection of the curious, may be seen in the Public Library of the British Museum.

† Coster's claims are impartially considered in one of the latest works on the subject of printing, entitled *De l' Origine de l'imprimerie en Europe, par Aug. Bernard.* Paris, 1853.

‡ *Beschreibung der öffentlichen Bibliothek zu Bamberg*, 1835.

3. That while there hangs much mystery about the performances of *Coster* and *Pfister*, no such obscurity rests on the career of JOHANN GENSFLEISCH, called GUTENBERG, of Mainz (born 1397, died 1468). It is proved by ample evidence that Gutenberg, about 1436, conceived and subsequently realised, the essential idea of forming letters separately, so as to be capable of re-arrangement, and that from his establishment, which he had founded with the assistance of JOHANN FUST, issued, between 1450 and 1455, the first important works printed with moveable types. Johann Gutenberg is therefore justly entitled to be considered as the real inventor of letter-press printing, and the city of Mainz as the classical spot from which this valuable invention was propagated throughout the civilised world.

4. That to PETER SCHOEFFER, of Gernsheim (born 1420, died 1503), the partner of Fust after Gutenberg's secession, must be awarded the great merit of having completed Gutenberg's invention by his discovery of a greatly improved method of casting the types.

Johann Gutenberg, the last of his family, died poor and childless about 1468 and was buried in the Church of St. Franciscus, at Mainz. A monument by Thorwaldsen erected to Gutenberg's memory in 1837 adorns the 'Gutenberg Platz,' of Mainz.

Thus, there issued from the brains and skilful hands of these artificers, that mighty engine which has the power of putting the times out of joint and of setting them right again. Hanging like the sword of Damocles over the heads of tyrants and corrupt administrators,

this chief guardian of the people's rights and liberties, is, if possible, fettered, in most countries, with adamantine chains.

But, as with many other wonders by which we are daily surrounded, we have become too familiar with "the black art," fully to appreciate it; and our only marvel perhaps is, that according to the adopted chronology, 5,000 years should have elapsed before the human mind made this lucky hit, which, like every other important discovery seems, *after* it is made, so simple and so easy.

The introduction of printing into England, is generally ascribed to William Caxton, (born in Kent, 1412), who had learned the art in Cologne, and after a residence of about thirty years on the continent, chiefly at Bruges, returned to England about 1474.

Caxton, it is said, first exercised his art in an old chapel, near the entrance of the Abbey of Westminster. All that is, however, really known, is, that Caxton lived near the Abbey, and sold his books in the Almonry. *The Game and Playe of the Chesse*, is generally considered as the first book printed in England. Bernard, however, believes that Caxton printed the first edition of this book in Cologne, and that his first essay in England, consisted in printing the *Propositio clarissimi Magistri Johannis Russell, &c.* The first work executed by Caxton, which has a positive date, is entitled *The Dictes and sayings of the Philosophers.* 1477.

Caxton died full of years, in 1492, and was succeeded in his business by the celebrated printer, Wynkyn de Worde.

CHAPTER XV.

ANALYSIS

OF THE

ENGLISH ALPHABET.

A.—This letter represents, in our language, five different sounds as in *bare*, *bar*, *any*, *back*, *ball*. The first is the *name* sound; the second or its open sound is the most natural and simple of all sounds. To produce it, the mouth is merely opened for the passage of the sounding breath, without requiring the contraction necessary in uttering any other vowels. Many of the lower animals are capable of uttering it, and it is generally the first sound enunciated by infants, serving to express a variety of emotions. In the continental languages, the *a* is pronounced open, as in *bar*, the only difference being that the syllable is either short or long; and we find it occupying the first place in most

known alphabets, excepting in the Ethiopic and the Runic alphabets.

A, as a musical sound is capable of considerable expansion; hence it is the favourite vowel of singers, and its frequent occurence in a language, as in the Italian, renders it, perhaps, more musical.* Some philologers are of opinion that the open *a* was the original vowel in most words expressive of strength, quickness, &c., in which it is found to predominate, although the words may commence with a consonant. This letter occupies, in many dictionaries, the largest space.

A, as a numeral, indicated among the Greeks, 1; among the Romans, 500, and with a dash on the top, 5,000.

B, which, in most languages occupies the second place in the alphabet, belongs to the order of mutes and labials, with which it readily interchanges. From the circumstance that the modern Greeks pronounce *b* like *v*, and that their ancestors wrote Birgilius for Virgilius, it is considered probable that the ancient Greeks pronounced *b* like *v*. The interchange of *b* with *v* is frequent in the Romance languages, as in the Italian, Spanish, and the dialects of the south of France. This consonant is also converted into *m* and *p*, especially into the latter, which merely requires a stronger breathing.

B is silent in many words derived from the Latin, when it occurs before *t*, forming with it but one syllable, as in *debt*, *doubt*, *&c.*; it is also mute in various words

* The difficulty of singing in the principal European languages is, according to Bennati, progressive in the following order:— Italian, Portuguese, Spanish, French, German, English.

of Saxon origin, when placed in juxtaposition with *m*, as in *lamb*, *comb*, *dumb*. When the *t* or *b* belong to the next syllable, it is pronounced, *sub-tract*, *lam-bent*.

B, as a numeral, denoted among the Greeks and Hebrews and the Arabians, 2; among the Romans 300, and with a dash over it, 3,000.

The mechanism by which this sound is produced, is very simple, requiring merely the close compression and opening of the lips. The tongue has no share in it, of which stammerers must be frequently reminded.

C, the third letter of most European alphabets, is employed to express various sounds among different nations. The Greeks, who had no *c*, supplied its use by the *kappa* and *sigma*. That the *c* and *k* in the earliest alphabets of the Romans corresponded to the *gamma* and *kappa* of the Greeks is evident, from the abbreviations of names.

Thus *c*, frequently represents Gajus; *c n*, Gnaeus; *leciones* for *legiones*. In order to obviate the difficulty of this double signification, Spurius Carvilius invented, according to Plutarch, the *g*, by adding a stroke to the *c*, henceforth representing the sound of the *k*, which gradually disappeared from the Latin language.

C is by Cicero, called *litera tristis*, as it stood for *condemno* in the little cubes (tessera) upon which the judges wrote in trials their sentences, for the same reason, *a* was called *litera salutaris* being the representative of *absolvo*.

C, as a numeral, denotes 100, and answers in music to the *do* of the Italians.

In our own language, *c* represents the following sounds.

Like *s*, before *e*, *i*, *y*, *cellar*, *city*, *cypher*. It is not sounded at all when preceded by *s*; *sceptre*, *scene*; and is also silent between *s* and *l*; *muscle*.

Like *k* before *a*, *o*, *u*, *l*, *r*, and other consonants; *cap*, *cord*, *curt*, *cloud*, *crow*.

Like *sh*, after an accent and before *ea*, *ia*, *io*, and *iou*; *ocean*, *social*, *phocion*, *rapacious*.

Like *z* in *sacrifice*, *suffice*.

C is silent in some words, as in *victuals*, *muscles*, *indictable*, *&c.*

C combined with *h* sounds like *tsh* in words not classical; *child*, *chop*, or like *sh* when preceded by *l*, *n*, *quench*, *Welch*. In words derived from the Greek, it sounds like *k*, as *chemist*, *echo*, *stomach*, *&c.*; or when *ch* precedes an *l* or *r*, as *chlorine*, *chronic*.

In some words *ch* is silent, as in *yacht*, *drachm*, *schism*, in which the *sch* sounds like *s*.

In the Scotch word *loch*, the *ch* has the sound of the Greek *chi*, and is guttural, which sound does not exist in English, hence the word is pronounced *lok*.

D, the fourth letter in our alphabet belongs to the order of the palato-dentals and linguo-dentals.

The Roman *d* is borrowed from the Greek, which is a triangle.

D interchanges readily with *t*, *l*, and other sounds produced by the same organs; it corresponds with the German *t*, as *tief*, deep, *tag*, day. It has an affinity to *s* with which it forms *z*, and readily attaches itself to *n*, as *cinder*, from the Latin *ciner*, and *tender* from *tener*.

D is produced by the presure of the tongue against the gums of the upper front teeth and the roof of the

palate, and its pronunciation becomes faulty when the tongue is pressed against the lower front teeth, which, according to Kempelen, is frequently done by weak-minded persons and idiots. Stutterers have some trouble to pronounce *d* in connection with a succeeding vowel.

Besides its name sound, as in *deed*, *d* sounds like *t* at the end of words after *c*, *f*, *o*, *e*, *sh*, *ch*, and especially after *k*, *s*, *p*; as in *plac'd*, *snuff'd*, *pluck'd cross'd*, *dipp'd*.

The reason is that except in solemn discourse the *e* in the past tenses is rarely sounded, so that the *d* is placed in contact with letters combined with which it is not easily pronounceable, and is changed into *t*. In modern orthography *blessed* is written *blest*, *spelled*, *spelt*, *&c.*

D as a numeral signifies 500, and with a dash over it 5,000 In music it answers to the second note in the diatonic scale to which *re* was applied by Guido.

E, the second vowel and the fifth letter of our alphabet lying (*see system of vowels*) between *i* and *a* interchanges more readily with these vowels than with *o* and *u*. This letter expresses very different sounds, as in *he*, *ell*; the first is its name sound, and is long, the second is short. In exceptional cases it sounds like *a*, *Derby*, (Darby), *Clerk*, (Clark), *sergeant*, (sargeant).

E in Greek numeration signified 5, and in music answers to the *mi* or third note of the diatonic scale.

F is a labio-dental aspirate belonging to the semi-vowels. It is produced by bringing the upper incisors against the lower lip, while breathing with a hissing

noise. Hence persons who have lost their upper front teeth cannot readily produce a pure *f*. It has two sounds in English, the first, the name sound as in *fire*, the second like *v* in *of* as in *where-of*. *F* interchanges with other letters produced by similiar movements as *v* and also with *b* and *p*. The Germans pronounce *v* like *f*, and the Italians generally write *f* for *ph*, thus *filosofia*.

F signified among the Romans 40 with a dash over it 40,000.

F in music denotes the fourth note of the diatonic scale answering to the *Fa* given to it by Guido.

G, the third letter of the Semitic, and also of the Greek alphabet, has in English two sounds. The hard *g* as in *gum* is a medial of the guttural order, and is produced by pressing the arched tongue against the roof of the mouth close against the soft palate, and then, in breathing, lowering the tongue. In the production of the soft *g*, as in *German*, the point of the tongue is pressed partly against the gum and partly against the front part of the roof of the mouth. As a general rule *g* is like *c*, hard before *a*, *o*, *u*, *l*, *r*, and occasionally before *i* and *e*. *G* is convertible with *k*, *y*, *ch*, *&c.*, the production of which requires but a slight change in the mechanism employed in enunicating the hard *g*. *G* is silent in many words before and after *n*, *gnash*, *benign;* it is also mute in many words when united with *h*, *night*, *might*. The Scotch give to *gh* the guttural sound *ch*, and pronounce night, *nicht*. The guttural sound *ch*, as in the Scotch *loch*, is produced by pressing the tongue to the roof, as

in the production of the hard *g*, and breathing strongly without changing the position of the tongue, while in the production of the sound *ch* in *nicht*, or in the German *ich*, the position of the tongue is slightly altered and the expiration is softer.

G in music answers to *sol*, the fifth note in the diatonic scale, to which it has given the name gammut, compounded of Gamma-ut.

G, as a numeral, anciently denoted 400, and with a dash over it 40,000.

H. This sound is strictly speaking neither a consonant, nor a vowel. The whole vocal and respiratory tube is widely opened for its production—the soft palate is drawn upwards and backwards, preventing the passage of the breath through the nostrils; the tongue lies quiescent. The expiratory abdominal muscles contract; and a sound, certainly not articulated, is produced, being the result of the friction of the air current against the walls of the glottis and the *isthmus faucium.*

The Greeks. who considered this sound as a mere breathing, had no letter for it, but merely distinguished it by the *spiritus asper* and *spiritus lenis*, the latter of which they placed over the vowels commencing the words which were to be pronounced without the rough breathing. The modern character is derived from the Hebrew *heth* or *cheth.* The English name *aitch* is supposed to have been at first *ech.*

It ranks as a guttural aspirate in those languages in which it is considered as a consonant. In connection with other consonants, *h* renders them sometimes softer, as after *p*, *t.* In Italian, from which

the *h* has been almost banished, it serves to give to *g* and *c* hard sounds; as *che*, pronounced *k*, and *ghibellino*, as *go*. In the Slavonic languages, *h*, at the beginning of a word, is frequently pronounced as *g*. Hospodar sounds Gospodar. *H* is interchangeable with *c*, *ch*, *f*, *s*, and is in English silent in many words, as in *shepherd*, *honor*, *heir*, *&c.*

This sound may, in fact, be considered as the starting point of all articulation, and, as it requires more breath in producing it than any other sound, its repetition is fatiguing, as the air from the lungs is rapidly discharged.

"In the good olden time, there was whistling, barking, crowing, braying, in short, all the sounds which the human organ is capable of imitating were almost nightly heard in the common house of parliament. It seems, however, that since the passing of the reform bill, honourable members no longer display their vocal powers to such an extent, but have for the expression of their feelings, adopted the more simple sounds, Hear! hear! and Oh! oh!

"When the enthusiasm of the house is fairly roused, the noise by the repetition of the word *hear*, is as great as if the members were to give a regular three times three. As the aspirate *h* is not easily pronounced in rapid succession, the sounds approach yah! yah! Even in common life, this pronunciation is adopted. A swellish Mr. Treacle, in the pulpit, reading "He that hath ears to hear let him hear," will pronounce it "He that hath yahs to ya let him yah."*

* From an Article on Life in the House of Commons, in the *Illustrated Times*.

I, being one of the three primitive vowel-sounds, is interchangeable with other vowels, and forms a component part, and the final vowel of many dipthongs. In English, *i* has four sounds—short as in *tin*, long as in *routine*. Most of the words which have preserved the long sound are of foreign origin. The third or name sound of *i*, as in *mine*, is the diphthong *ai* rapidly pronounced. The fourth is the short and obtuse sound, heard when the vowel is followed by *r*, as in *sir*, *fir*, *circle*, &c.

In the production of the primitive vowel *i*, corresponding to the English *ee*, the lips are parted, the edges of the tongue touch the superior molars, and the tongue is moved upwards, so that the space between palate and tongue is reduced to smaller dimensions than in the production of any other vowel. It thus stands on the extreme edge of vocalism, forming, as it were, a connecting link between the vowels and the consonants. A slight change in the position of the tongue produces the sound of *y*, as observed in most cases when *i* is preceded by a consonant, and has a vowel after it (onion); hence *i* is considered a vowel in some cases and a consonant in others.

In all words of Latin origin when *i* precedes a vowel (unless it follows one) it is a consonant, as *Ianus* (Janus); but in Greek words it is a vowel, as *iambus*.

As a numeral, *i* signified among the Romans 1; before *v* and *x*, it subtracts itself; after *v* and *x*, it denotes the addition of units.

The dot over the *i* was not added until the fourteenth century. The French have a proverb—"*Il met les*

points sur les i." (he dotts his i), denoting thereby a person occupied with trifles. The Italians frequently substitute *i* for *l*, as *fiamma for flamma.*

J. This letter represents different sounds in various languages. In English it has nearly the same sound as *g* in *gem;* in German it sounds like *y* in *year*; while in Spanish it represents now a guttural. The Spaniards now write *Jeres* instead of *Xeres*, the town which gives the name to our sherry.

The form of this letter was originally identical with *i*, and it is only within a comparatively recent period that a distinction was made between them. In some dictionaries, these letters, although representing distinct sounds, are still mixed up.

The Romans wrote the words which we write with *j*, as *Jupiter*, with an *i*. There is also no doubt that originally the name was written *Diupiter.*

K, the *kappa* of the Greeks, and the *caph* of the Hebrew alphabet, is the tenuis, or the pure mute, and differs in its production very little from its medial, the hard *g*, except by a stronger pressure of the tongue, and a stronger aspiration. *K*, like *g*, is silent before *n*, *knight, know*, and has the same sound as *c* before *a*, *o*, *u*, before which vowels *k* rarely occurs. It is considered a superfluous letter; but its use before *e*, *y*, or *h*, as in *key*, *kine*, &c., is sufficiently obvious, because, if these words were written *cey*, *cine*, the *c* would sound as an *s*.

The practice of adding *k* to *c*, as in *musick*, *publick*, introduced by Johnson, though now generally abandoned, is still pursued in regard to certain monosyllables,

such as *lock*, *shock*, on account of the pronunciation of its derivatives, which would then have been *loced*, *shoced*.

K, as a numeral, stands for 250, with a dash above it, for 250,000.

In Latin, *k* was never used but before *a*, just as *q* only before *u*.

L, the *lambda* of the Greeks, and the *lamed* of the Phœnicians and the Hebrews, is a liquid or semi-vowel. The sound is produced by the pressure of the anterior part of the tongue against the palate near the teeth, the sound escaping through the corners of the mouth. *L* is nearly allied to the palato-dental consonants and the liquids *r* and *n*,* with which it freely interchanges. The frequent interchange of *l* with the lingual *r* is owing to their mechanism of production being nearly the same, differing only that in the latter the tongue vibrates. There are whole tribes and nations which always substitute *l* for *r*, while there are some who do not pronounce the *l*. The double *l* beginning Welsh words with *Llan* is by some pronounced *thran*, or *clan*, by others *flan* The French *ll*, preceded by *ai*, *ei*, *oui*, as in *travailler*, *&c.*, is pronounced nearly as our *y*. In English the *l* is silent when placed between a vowel and a consonant, as in *balm*, *half*, &c.

L, as a numeral, signified among the Romans, 50, and with a dash over it, 50,000.

M. This letter belongs to the series of liquids or

* The author is informed by his erudite friend, Mr. Thomas Wright, that the Normans could not easily pronounce *Lincoln*; they invariably wrote *Nicoli*, and in all Norman documents the Earl of Lincoln is always *li quens de Nicole*.

semi-vowels. The sound is produced by a gentle compression of the lips and a slight expiration through the nose. It is thus a labio-nasal sound, and being very easily produced, is one of the first consonants which children learn to pronounce in connection with the vowels, *a* and *e*. When the nose is perfectly closed, *m* cannot be pronounced; it then sounds like *p* or *b*, with which letters, as well as with *n* and *v*, it frequently interchanges. *M* is completely mute in whispering, and does not, as an initial, admit of being followed by a consonant.

As a numeral, *M* signified, among the Romans, 1,000, and with a dash over it, 1,000,000.

N. The sound which this letter represents is produced by the pressure of the point of the tongue against the teeth and the palate, while the air is chiefly escaping through the nasal passages. *N* belongs to the liquid series, and is a lingual and nasal letter. It readily interchanges with the other liquids, *m*, *l*. When the *n* is a final letter, it acquires a strong nasal sound equivalent to *ng*. In some languages, *n* is preceded by an aspirate, thus the Anglo-Saxons wrote *hnecca*, whence our *neck*. This letter is silent at the end of a syllable, after *m* or *l*, as in *condemn*, *hymn*, *kiln*, *&c.*

N, as a numeral, signified among the Romans, 90, and according to Baronius, 900, and with a dash over it, 90,000.

O, is the fourth vowel in our alphabet. The lips are, during its production, pointed in such a a manner as to form an aperture resembling nearly the letter. If the opening of the lips be slightly altered, *o* passes into

a or *u*. The character *o* designates a variety of different sounds in our language, as exemplified in *no*, *not*, *nor*, *move*, *women*.

The interchanges of *a* and *o* are shown in comparing the English *one*, *two*, *stone*, with the Scotch *ane*, *twa*, *stane*, *&c*. The Romans constantly changed the Greek syllable *os* into *us*, while the Italians again changed the *u* into *o*. As an interjection, *o* expresses a variety of emotions.

O, as a numeral, signified in middle Latin, 11, with a dash over it, 11,000

O, with an apostrophe after it, signifies son in Irish names.

O is silent in many final syllables, and is replaced by the obscure *e*; *prison*, *poison*, *person*, *glutton*, *&c*.

P is a pure mute of the labial class. It is produced by compressing the lips, so that the collected breath issues with an explosion. Being the *tenuis* of *b*, it readily interchanges with its medial as already noticed under that letter. *P* is also convertible into *f*, as *pater* into *father*. With *v*, especially in Romance words, Latin *decipere*, *deceive*. The Germans frequently add *f*; thus they have *pfeffer* for our *pepper*. The aspirated *p* followed by *h*, represented by the Greek *o*, answers to the English *f*, as stated under *h*. *P* is silent when it precedes *s*, *t*, as in *psalm*, *ptisan*, *receipt*. When, however, the *t* belongs to the next syllable, the *p* must be pronounced, as in *reception*, *capture*.

P, as a numeral, stands, in low Latin, for 100, and with a dash over it, for 400,000.

Q is a mute of the guttural series nearly articulated like *k*. Neither the Greeks nor the ancient Latins had this letter, for they wrote *oblicus* not *obliquus*, before they borrowed the *q*, from the Phœnicians. In the Anglo-Saxon *cw* is used instead of *q*, as in *cwen*, our queen,

Q is, in fact, a compound consonant, consisting of *k* and *w*, or *k v*, although originally it may have sounded *k u*, in which case it must have formed a syllable. Thus in English, quality is pronounced *kwality*, and not *ku-ality*, the mechanism in the production of *kwa* being easier than that of *ku-a*.

Q never ends an English word, and is always followed by *u*, to which circumstance is owing the peculiar form of the lips and cheeks, which distinguish its mode of articulation from that of *k*, to which it is analagous in every other respect, so that it is considered as a superfluous letter.

The pronunciation of *q*, caused in 1551 considerable excitement among French scholars. The professors at the Sorbonne pronounced *kis kis*, and *kin kam*, instead of *quis quis* and *quin quam*, and deprived ecclesiastics of their benefices who fell into the heretical mode of pronouncing this letter. The celebrated Peter Ramus was thus persecuted, but having with other q-ites, appealed to Parliament, a decree was passed, granting to the people full liberty to pronounce *q* any way they liked. Peter Ramus is also said to have introduced the characters *j* and *v*, for *i* and *u*, whence these letters are also call *Ramian* letters.

As a numeral *q* signified 500, and with a stroke over it, 500,000.

R. This letter, usually numbered among the liquids or semi-vowels, is pronounced in different ways in various languages and dialects. The common and natural mode of producing it, is by an expiration, while the tongue touches the roof of the mouth with a tremulous motion; hence the letter is called *consonans tremulans*. From this lingual *r* must be distinguished the guttural *r*, which is produced by the contact between the posterior part of the tongue and the soft palate, when the vibration of the uvula is effected by the passing air current. The palatal *r* is scarcely admitted to be a legitimate speech-sound, and is by most writers considered as a fault in elocution.

The lingual *r*, requiring a quivering motion of the tongue, is not easy to pronounce, and is one of the last letters which children learn; and when the tongue is too thick or closely attached, it is not acquired at all.

In some languages the *r* is altogether wanting, when *l* is substituted for it, which differs from *r*, chiefly with regard to the vibratory motion of the tongue. *R* interchanges also with *n* or *s*, and is in English sometimes confounded with *w*, so that either from inability to pronounce the *r*, or from affectation, Roman is pronounced *Woman;* rubbish, *wobbish*, &c.

The Latins wrote *h* after *r*, to represent the aspirated sound of the Greeks, a practice which we follow in such words as *rhythm*, *rhetoric;* though as far as pronunciation is concerned, the *h* might be safely omitted.

R, among the Romans, signified 80, as a numeral, and with a stroke over it, 80,000.

S, which represents the principal hissing sound in our language, is produced by the passage of the air current between the roof of the mouth and the tip of the tongue and which escapes through the teeth. This sibilant has four sounds in our language, exemplified in the words *sin*, *wise*, *sugar*, *intrusion*. *S* has its sharp hissing sound generally in the beginning of words, before vowels. In the middle and at the end, it sounds frequently soft like *z*, especially before a mute *e*, as *these*, *refuse*. At the end of monosyllables, it is sometimes sharp, as *this*, and sometimes flat, as in *has*.

It is remarkable that the double *s* instead of sharpening the sibilant, frequently softens it, as in *possess*, *hussar*, in which it sounds like *z*. In words compounded with *dis*, when followed by pure mutes, the *s* is generally sharp, *dispel*, *discover*, *distress*.

Before *ion*, if a vowel precedes it, the *s* sounds more like *j* than like *z*, as in *confusion*.

This letter plays no mean part in the inflections of many languages, probably from the facility with which it can be added.

As the sound of *th* may be said to form the bridge between *t* and *s*, these letters are convertible, so that *has*, *does*, and *gives*, are now preferred to *hath*, *doth*, and *giveth*. *S* also interchanges with *d*, *r*, *sh*, *&c.* It is silent in *island*, *aisle*, also at the end of French words.

As a numeral, *s* signified, among the ancients, 7.

T is a pure mute, representing an aspirated *d*, in the

same manner as *k* and *p* are *g* and *b* aspirated. The sound is produced by placing the tongue against the roots of the upper teeth, followed by a quick expiration. Differing in its mechanism but little from that of *d*, these letters constantly interchange. On account of the hardness of its sound, *t* is frequently employed to separate *liquids* or vowels, as in German, *eigen-t-lich*, in French, *dira-t-il*.

T before *io*, *ia*, passes generally into *sh*, as in *nation*, *martial*.

Th, although composed of two characters, represents but one sound, though differently pronounced, as in *thing* and *that*. The Greeks had their *theta*, which formed the intermediate sound between *d*, *t*, and *s*, and was accompanied by a lisp. The Romans, who did not possess it, wrote *th*. It is certain that the northern nations, and especially the Anglo-Saxons, had a sound between *d* and *t*, and *t* and *s*.

Foreigners who do not possess this sound, rarely, if ever, require it, and pronounce *nossing*, or *noting* for *nothing*, and *zing*, *dsing*, or *ding* for *thing*. The Germans appear to have lost this sound in speaking, although they continue to write it, as in *Thal*.

T is also convertible with *s*, *z*, *l*, *&c*.

As a Roman numeral, *T* signified 160 and with a stroke over it, 160,000.

U, as expressed in *rule*, is one of the three fundamental vowels, and has retained this primary sound in most of the continental languages.

In English *u* respresents a variety of sounds, as in *rude*, *run*, *union*, *bury*, *busy*.

As the production of *u* is nearly like that of *o*, only that the opening of the lips is closer, and the aperture less pointed, these vowels pass into each other in many languages. We do not possess in our language an intermediate vowel between *u* and *i* like the French *u* and the German *ü*. The Romans, although *u* was called by them a vowel, said that it possessed the power of a consonant, because it was not easy to pronounce it before some vowels. Now we write generally *v* before such vowels, thus, for *silua*, *silva*. The Romans had only one character for *u* and *v*.

V. The sound represented by this letter is produced by a gentle respiration, whilst the lower lip is pressed against the upper teeth. It is thus a labial aspirate differing little from *f*, except that the expiration is more gentle in the formation of *v*, and it bears the same relation to *f* as *p* to *ph*. It is not a little remarkable that the Germans who possess this character generally pronounce it like *f*, while their *w* corresponds to the English *v*. The sound which *v* has now acquired, differs so much from that of *u*, that the custom which had hitherto prevailed of mingling the two letters in dictionaries, is gradually being abandoned. *V* interchanges with *f*, *b*, *w*, *ph*, *&c*.

As a numeral it denoted 5, and with a stroke over it in some old books, 5,000.

W. The name of double *u* given to this letter in English may be applicable to its form, but not to its power. It represents both a consonant and a vowel—it forms in fact one of the transitions from vocalism to consonantalism. Generally speaking, when *w* is initial

as in *well-wisher* it is consonantal. The English pronunciation of *w* is peculiar, so that those nations who do not possess it, find some difficulty in pronouncing it. It resembles the French *ou*, so that *well-wisher* is pronounced like *ouell-ouisher*. In Latin the consonantal *v* had, perhaps, the power of *w*.

W, as a vowel, is chiefly used at the end of syllables. It is generally silent at the end of words, after *a* and *o*, as *saw*, *bow ;* and also before *r*, as *wrong*, *wrist*, *&c.* *W*, the consonant, interchanges with *v*, *ph*, *f*, *y*, and also with *g*, (*e.g.*) Guillame (*William*), Galles (*Wales*), guard (*ward*).

The substitution of *r* for *ow*, and *v* for *w*, or *vice versa*, gives rise to such vulgarisms as *vidder*, *vinder*, *feller*, for *widow*, *window*, *fellow*.

X. The character now used for this sound was, among the Greeks, before they employed *xi*, a guttural aspirate equivalent, to the *ch* in the Scotch word *loch*. The Italians, who have an antipathy against all gutturals, never use *x*, but substititute *ss* for it when it comes between two vowels, as *Alessandro* for Alexander, or they supply *c* for it, as in *eccellente*.

In French *x* is variously pronounced as *s*, *cs*, *gs*, *z*, and in many words it is not pronounced at all, and is merely indicating the plural.

In English *x* represents three sounds ; *ks* in *explain*, *gs* in *exist*, and *z* in *Xenophon*.

The sound of *gs* is generally given to the letter when it precedes the accent and is followed by a vowel or the letter *h*, as in *examine*, *exhaust*, and that of *z* when it occurs at the beginning of a word, as in *Xerxes*.

X played an important part as a number among the Romans. Being composed of two *v's*, ⋎⋏, (x) it denoted 10. In a horizontal position ⋈, it signified 1,000, and with a stroke over it, 10,000. When it stands before a large number it must be subtracted, when after, it must be added.

Y represents both a consonantal and a vowel sound. The letter is derived from the Greek *v*, which sounded like the French *u* or the German *ü*. It is used as a consonant before vowels, and in the beginning of words, as *yes*, *year;* and the sound is produced by the emission of breath while part of the tongue is brought into contact with the posterior part of the palate. This sound is also expressed, though not written, before a long *u* in the beginning, and before *o* preceded by *i* in the middle of a word, *e.g. unity*, *onion*.

In the Anglo-Saxon, this sound was denoted by *e* before *a* or *u*, and by *i* before *e* or *u*, eorl, Eotaland *earl*, *Jutland*.

The old-fashioned spelling *y^t*, *y^e*, for *that*, *the*, has no doubt arisen from the form of the Anglo-Saxon character, which expressed *th*.

Y, as a vowel, has, like *i*, three sounds; short, like *i* in *sin*, mostly in words of Greek origin; long, like *i* in *routine*, generally at the end of words, where there is in English a great tendency to place it; and the diphthongal sound, as in *mine*, when it is accented as in *fly*, *supply*, and also in some unaccented final syllables in verbs, such as *satisfy*, *indemnify*, *&c.*

As a number, *y* stands for 150, with a stroke over it, 150,000.

The Germans have now entirely rejected the use of *y;* as the consonantal sound is represented by *j*, and the vowel, by *i*.

Y was called by the ancients, *litera Pythagorica*, as Pythagoras considered its form the symbol of human life, the stem representing youth, and the top the two paths of virtue and vice.

Z, the last letter in our alphabet, represents a sibilant sound produced like *s*, the breath not being emitted with the same force, while the tongue is pressed somewhat closer to the palate, and bears thus the same relation to *s* as *v* to *f*. In the German, the *z* has an intermediate sound between *c* and *ts;* in Italian it sounds like *ds;* in Spanish it corresponds to our *th*, and in French, when sounded, it resembles an *s* forcibly pronounced.

No English word begins with *z*, although the letter is found in Saxon alphabets.

Z interchanges with *d*, *g*, *s*, *t*, *&c.*

As a numeral, *Z* signified 2,000, and with a dash over it 1,000 times 2,000, or 2,000,000.

Quintilian calls it—dulcissima, jucundissima.

Summary of the Powers of Single Letters.

	Sounds.	
A	5	Stare, star, staff, stands, stall.
B	1	Bell.
C	4	Cemetery, cry, suffice, social.
D	2	Did, graced.

E	2	Evil, hen.
F	2	Full, of.
G	3	Gentle, give, rouge.
H	1	Help.
I	4	Inn, routine, mine, sir.
J	2	Judge, hallelujah.
K	1	Kirk.
L	1	Lime.
M	1	Mamma.
N	2	No, shank.
O	5	On, oh, move, one, women.
P	1	Papa.
Q	1	Quell.
R	2	Ram, arm.
S	4	Son, is, sure, treasure.
T	2	Pot, potion.
U	5	Pull, union, rude, but, busy,
V	1	Vivid.
W	1	Wall.
X	3	Lax, examine, Xerxes.
Y	3	Year, rhyme, hymn.
Z	2	Azure, gizzard.

*Digraphs and Diphthongs.**

Aa is only found in foreign words, such as *Kraal*, (a

* The difference between a digraph and a diphthong is, that in the former, one vowel only is pronounced, while in the latter both vowels are sounded. Thus *ea* in *head* is a digraph; but *oi* in *boil* is a diphthong.

Hottentot village) and some proper names; it has then the long open sound of *a* in bar.

Ee represents the long *i*, as in *marine; bee.*

Oo represents, first, the long *o: floor;* 2, the long *u: boor;* 3, the short *u: good;* 4 the obsure *u: soot.*

I, *u*, and *y* are rarely doubled. In *genii* the vowels are pronounced separately, thus, *je-ne-i.*

Ae has nearly the same sound of *e*, which is gradually supplanting this diphthong: aequator, *equator;* Aegypt, *Egypt.*

Ai, like *a* in male: *tail*, *said.* In some few foreign words *ai* sounds like *i;* aisle is pronounced *ile.*

Ao, the long *o*, *goal.*

Au, like *aw*, in raw, *caught.* In some words, as *draught*, the diphthong has the open, short sound of *a* in *craft.*

Ea has four sounds: like *e* in be, *beat;* like *e* in pet, *head;* like *a* in pare, *pear;* like *a* in tar, *heart.*

Ei, four sounds: like *a* in dane, *deign;* like *e* in hen, *heifer;* like *e* in be, *receipt;* like *i* in mine, *height.*

Eo, four sounds: like *i* in ravine, *people;* like *e* in red, *leopard;* like the long *o* in bone, *yeoman;* like *u* in cut, *luncheon.*

Eu has generally the power of *u* in *union*, *eulogy.*

Ie represents, firstly, the long *i as in routine*, *fiend;* 2, the short *e*, *friend*; 3, the name sound of *i*, *lie.*

Oa has the long sound of *o* in bone, *road.*

Oe has the same sound as *oa*, *roe.* In some words it is sounded like *oo*, *shoe.*

Oi and *oy* sound generally alike, as in *broil*, *joy.*

Ou six sounds, first, as in *house;* 2, like *u* in *rule*,

tour; 3, like *u* in put, *would;* 4, like *a* in *call*, *thought;* 5, like *o* in bone, *soul;* 6, like the indistinct *u* in burn, *young*.

Trigraphs and Triphthongs,

Eau, generally found in French words, is sounded like the long *o*, thus *beau* is pronounced *boh*.
Eou sounds like *iou* in *gracious*.
Eye like the long *i*, *eye*.
Ewe like *u* in *union*.
Iew like *ew*, *view*.
Uay, like *e*, *quay*.
Uoy, like *oy*, *buoyant*.

The relative proportion of letters required in English printing have, by long experience, been settled thus:—

A, 85—b, 16—c, 30—d, 44—e, 120—f, 25—g, 17—h, 64—i, 80—j, 4—k, 8—l, 40—m, 30—n, 80—o, 80—p, 17—q, 5—r, 62—s, 80—t, 90—u, 34—v, 12—w, 20—x, 4—y, 20—z, 2.

Hence, *e* is used sixty times oftener than *z*, and about thirty times oftener than *j*, *x*, or *q*.

CHAPTER XVI.

ENGLISH ORTHOGRAPHY

AND

ORTHOËPY.

THE study of the powers of the twenty-six letters individually and combined abundantly shows first: that our alphabet is both insufficient and redundant; and secondly, that the spoken words are, in most cases, utterly at variance with their written representatives. Our orthography has, therefore, like our constitution, become the wonder of the world, without, however, exciting the envy of surrounding nations. Voltaire somewhere says, "The English gain upon us two hours daily in their pronunciation, for they swallow half their words;" whilst Laharpe conceives that the viciousness of the English pronunciation seems to be in conflict with the articulation of the human voice.

The following dialogue between a Frenchman and his tutor, extracted from the *New York Home Journal*, affords an amusing illustration of our orthoëpic system.

"*Frenchman.*—Ha, my good friend, I have met with one difficulty—one very strange word. How you call *h-o-u-g-h?*

Tutor.—*Huff.*

Frenchman.—*Tres bien, huff;* and *snuff* you spell *s-n-o-u-g-h*, ha!

Tutor.—O, no, *snuff* is *s-n-u-ff.* The fact is, words ending in *ough* are a little irregular.

Frenchman.—Ah, very good! 'tis beautiful language. *H-o-u-g-h* is *huff*, I will remember; and *cough* is *cuff.* I have one bad *cuff*, ha!

Tutor.—No, that is wrong. We say *kauff*, not *cuff.*

Frenchman.—*Pardonnez moi*, how you call *d-o-u-g-h? duff*, ha!

Tutor.—No, not *duff.*

Frenchman.—Not *duff;* ah, *oui*, I understand—is *dauff*, hey?

Tutor.—No, *dough* spells *doe.*

Frenchman.—*Doe!* It is very fine; wonderful language, it is *doe;* and *t-o-u-g-h* is *toe* certainement. My beefsteak was very *toe.*

Tutor.—O, no, no; you should say *tuff.*

Frenchman.—*Tuff!* and the thing farmer uses how you call him *plough*, *pluff?* ha, you smile; I see, I am wrong, it is *plauf?* No? ah, then it is *ploe* like *doe;* it is a beautiful language, ver' fine—*ploe?*

Tutor.—You are still wrong, my friend. It is *plow.*

Frenchman.—*Plow!* Wonderful language. I shall

understand ver' soon; one more, *rough* is *ruff*, and *bough* is *buff*.

Tutor.—No, *bow*.

Frenchman.—Ah, very simple, wonderful language; but I have had what you call *e-n-o-u-g-h;* ha, what you call him?"

The American author committed, however, a great blunder in the selection of the pupil; for of all nations, our allies across the channel have the least right to laugh at the eccentricities of our pronunciation.

A writer in the French Encyclopædia says, in reference to French orthography and orthoëpy:—"The disagreement has become so excessive that no one dares to attempt a remedy. We pronounce one language—we write another; and being accustomed during the remainder of life, to the inconsistencies which have caused us so many tears in childhood, if we should renounce our bad orthography for one nearer to the pronunciation, we should not be able to recognize our spoken language under the new combination of characters."

But though French orthography may also be insane, there is certainly more method in its madness than in our system of spelling.

"No Englishman," observed the late Mr. Ellis,* can tell with certainty how to pronounce any word which he has only seen written, and has not heard spoken; nor can he tell with certainty how to spell a word which he has only heard spoken and never seen written. The

* *A Plea for Phonetic Spelling*, by Alexander John Ellis, B.A. London, Pitman, 1848.

problems are, in short: given the letters to find out their sounds—given the sounds to find their possible representative letters." And it is difficult to give a satisfactory solution, for much that is written is not spoken, and much that is spoken is not written.

In the second volume of Isaac D'Israeli's *Amenities of Literature* (page 241.) may be found the following curious specimen of our orthography in the infancy of our literature, addressed by the Duchess of Norfolk to the Earl of Essex. The Duchess, it must be observed, was "one of the most accomplished ladies of the sixteenth century, the friend of scholars, and the patron of literature." The letter runs thus :—

"My ffary gode lord—her I sand you in tokyn hoff the new eyer, a glasse of setyl set in sellfer gyld. I pra you take hit (in) wort. An hy wer habel het showlde be bater. I woll hit war wort a m. crone."*

Dr. Nott, who has preserved the epistle, supplies also the modernisation of this curiosity.

"My very good lord,—Here I send you, in token of the new year, a glass of setyll set in silver gilt; I pray you to take it (in) worth. An I were able it should be better. I would it were worth a thousand crowns."

Elizabeth herself, "the royal mistress of eight languages," seemed at a loss to spell *sovereign*, for she wrote it in seven different ways, while her favourite, Leicester, subscribed his own name in eight different ways.

The reader is probably aware that a controversy

* This letter is in the peasant dialect of Wessex and Middlesex. *See Note to p.* 284.

prevailed, which is scarcely settled as to how the name of our greatest dramatist should be written. Mr. Halliwell took, therefore, considerable trouble in the matter, and collected not less than the subjoined thirty-four varieties, which were employed by the poet's family in signing their names.

Chacsper	Shackspeare	Shakispere	Shakxpere
Saxpere	Shackspere	Shakispeare	Shakyspere
Saxspere	Shackspire	Shakspere .	Shakysper
Schakpere	Shagspere	Shaksper	Shaxper
Schakespeare	Shakesepere	Shakspeyr	Shaxpere
Schakespeire	Shakespear	Shakuspeare	Shaxspere
Schakespere	Shakespeere	Shaxeper	Shaxspere
Schakspere	Shakespere	Shaxkespere	Shaxpeare*
Schakspare	Shakespeyre		

Even such a monosyllable as *no* might be spelt in twenty different ways.

On the other hand, some words may be spelt in different ways without one letter belonging to them. Thus coffee may be spelt either *kauphy*, *kaughi*, or *kawghi*.

We should probably be astonished to read the MSS. of some well-known authors as they reach the compositor. The letter of a gallant admiral, published some time ago in the *Times*, in its "unsophisticated" state, seemed but an average orthographical specimen of a goodly number of contributions addressed to the respective editors. Thus the reporter of a morning paper recently complained that in the letters which reached him from various legislators, Chronicle was variously spelt *chronecal*, *chronical*, *cronical*, *cronicle*.

Sheridan, we are told, could not spell; and there are very few, indeed, whatever their education may

* *Halliwell's Life of Shakespeare.*

be, who are not now and then at a loss to write a very common word, in which case, unless a dictionary be at hand, there is no other resource left but to write the word down in different ways to judge of its character by its *looks*. It is, therefore, by no means surprising that at a late examination of candidates for civil appointments, the majority were rejected for bad spelling. One word "example" is said to have been spelt ten different ways.

It is very probable that so long as the Anglo-Saxon idiom preserved its purity, there was but little disparity between the written and the spoken language. The inconsistency of our phonetic system must, therefore, be chiefly attributed to the ordeals through which the English language had to pass before it was finally formed. When it is considered that not only were the inflexions abolished, but that Anglo-Saxon, Norman and Roman words constantly intermingled, the anomalies between our orthography and orthoëpy are sufficiently accounted for.

This discrepancy necessitated a number of rules for pronunciation, which, in some foreign English grammars, occupy a disproportionate space of the work, while in England it has given rise to a number of *pronouncing dictionaries*, which scarcely exist, nor is there, with exception to the French, any call for them in the continental tongues.

Let it, however, not be supposed that the glaring disparity between writing and pronouncing escaped the attention of our forefathers. Besides Sir Thomas Smith, secretary of state to Queen Elizabeth, and other

writers of lesser note, we find that Sir John Cheke, (born 1511,) professor of Greek, at Cambridge, tried hard to correct the orthography and pronunciation of the English language. Cheke disliked the early translations of the Bible, on account of their containing so many foreign words; he therefore re-translated the gospel of St. Matthew, in which he introduced his own orthography, of which the following few rules may give some idea. Whenever a vowel required to be sounded long, Cheke generally doubles the letter, omitting at the same time the final *e*. Thus he writes *taak*, *haat*, *mijn*, *fijr*, *moor*, *stoon*, for take, hate, mine, fire, more, stone. The digraphs *ea*, *ei*, *oa*, *ue*, *ui*, *&c* he also expresses by a double vowel; *speek*, *preech*, *coot*, *&c.* for speak, preach, coat. He generally usually drops the final *e*, and writes *giv*, for give, and also those letters which are not pronounced thus; *det*, *dout*, for doubt, debt.*

After Cheke, Mulcaster†, and W. Bullokar‡ deserve notice as spelling reformers. Bullokar shows in the third chapter of his work "The wants, abuses, and unperfectnesse of the olde orthography for Inglish speech at this day in use, and how it is amended by

* We must bear in mind that the English pronunciation was very vague during the sixteenth century, even among the highest ranks; that Queen Elizabeth's court seem to have spoken pretty broad Wessex (*e.g.* the letter in page 281); while the gentlemen of the North kept up the Scandinavian, and those of the West Country the Western dialects. Cheke most probably pronounced *taak* and *stoon* as he wrote them, as does the Wessex peasant now.

† *On the Right Writing of our English Tongue*, 1582.

‡ *Book at Large for the Amendment of Orthography, &c.* Lond. 1580.

perfect letter, of *perfect* name, *perfectly* agreeing to the sound in voice."

Dr. Gill, the head master of St. Paul's school, also tried to improve the orthography. This work entitled *Logonomia Anglica quâ gentis sermo facilius adiscitur*, and dedicated to King James, was published 1621.

Gill was followed by Charles Butler, of Magd. Coll., Oxford, who, in his *Principles of Grammar, or the Institution of Letters*, (1633), proposed a new and more simple orthography, and printed this book as well as the celebrated treatise on music, which he subsequently published with Saxon and some new characters. In the Preface to his *Principles*, Butler laments that the tyrant custom "should always prevail, and that reason, whose right is to rule, should be still held in subjection, to the obscuring of the honour of that which is so dear unto us (our renowned country and language.")

Benjamin Franklin and John Pinkerton appear also to have indulged in orthographical experiments. Franklin adhered to the general principle laid down by Quintilian,* that words should be spelt as sounded, and conceived that the proper way of spelling wife is *yf*. Pinkerton had a scheme for rendering our lauguage more euphonious by adding a final vowel to the consonant, and omitting the consonant after a final vowel.

But the most systematic attempts to effect an English Spelling Reform were made by Messrs. Isaac Pitman and Alexander Ellis. In 1837, Mr. Pitman published

* *Quint. Inst. Orat.* Lib. 1. cap. vii.

his "Phonetic Shorthand," admitted to be one of the best systems of stenography. Some years afterwards, Mr. Pitman published, in conjunction with Mr. Hill, senior, the father of the Post Office reformer, the *Phonotyphic Journal*, printed in types constructed on Pitman's principles of phonetics. Mr. Pitman was eventually joined by Mr. A. Ellis, who became the chief expounder of the Phonetic system as it is. Space does not permit to enter into any examination, or to give an outline of this system. Those who take an interest in phonetic investigation, are referred to the *Essentials* of *Phonetics; the Alphabet of Nature; a Plea for Phonetic Spelling*, by J. A. Ellis, works full of interesting information, and in which the subject is very ably treated.

It is certainly to be regretted that these meritorious efforts should have met with but scanty success; but it is not surprising, for individual efforts are quite inadequate to such a task.

This has been already felt and expressed by T. Walker, in the preface to his Pronouncing Dictionary: "Thus have I ventured with *a trembling hand* to point out a few of the most glaring inconsistencies under which the orthography of our language labours, without daring to make the least step to a reformation myself: for if ever this be done to any good purpose it must certainly be done by the joint labours of our universities."

In the charter granted by George the Fourth to the Royal Society of Literature, that learned body is recommended *to fix the standard of the English language, and*

to preserve its purity. Rather an onerous task to give fixity to an idiom which, chameleon-like, is constantly changing the hue of its skin, and like a prism is constantly absorbing, reflecting, and refracting all rays of light which reach it. Nor is the quasi chemical problem so easily solved; to preserve the purity of a mixture which is ever acquiring heterogenous ingredients, so that it requires some critical acumen to recognise its base. These tasks the Royal Society of Literature is evidently unable to accomplish. Indeed, it has been shown that one of the excellencies of our language just consists in its great capacity of assimilating foreign elements, and converting them into its own substance. But what the Royal Society of Literature might in due time accomplish, and thus earn the fervent thanks of the rising, the risen, and coming generations, is to devise some standard of orthography, and so to introduce something like harmony between our written and spoken language.*

* Two prizes of £100 and £40 respectively, were last year offered for the two best essays on a reform in the spelling of the English language by the introduction of a phonetic instead of the present unphonetic spelling. The essays were to be sent to Sir W. C. Trevelyan, Bart., Wallington, Newcastle-on-Tyne.

CHAPTER XVII.

PASILOGY AND PASIGRAPHY.*

Man was at all times anxious to free himself from the curses which, we are told, were the consequences of his first disobedience. To avoid earning his bread by the sweat of his brow, he employs animal and mechanical power to work for him; to mitigate his pain, he uses anæsthetics; and to get rid of the curse of Babel, he tries to invent a universal language.

The possibility of constructing a language capable of serving as a medium of communication between all human beings, has been deduced from the fact that the same numerical, algebraic, and musical characters are adopted and understood by many civilised nations whose languages widely differ. Many speculative minds have, therefore, worked hard to create a uni-

* *Pas*, all; *logos*, word; *graphe*, writing.

versal language, the formation of which would, according to Leibnitz, lengthen man's life by a third, which he is now obliged to devote to the study of languages.

The principal continental writers on this subject, are Athanasius Kircher,' (*Polygraphia nova et universalis ; Romæ*, 1663); Joachim Becher, whose treatise, written in Latin, was translated into English and published in London in 1667, under the title of *The Universal Character*; Kalmar (*Praecepta grammatica atque specimina linguae philosophicae, &c., Berolini*, 1772).

Wolke, De Murr, Vater, and Hourwitz have also written treatises on Pasilogy.

Nor was the philosophical language neglected in England. Already, in 1657, Cave Beck, of Ipswich, published in London a work written in French, and entitled *Le Charactère Universel.*

In 1661 appeared a very remarkable treatise, by George Dalgairns, or Dalgarno as he called himself. This work, entitled *Ars Signorum, &c.*, is dedicated to Charles II, and has a royal proclamation prefixed to it, recommending its study as being "of singular use for facilitating the matter of communication between peoples of different languages."

In 1668, John Wilkins, Dean of Ripon, and afterwards Bishop of Chester, "so bold a speculator, that he deemed a journey to the moon a possible achievement," published his ingenious work, *An Essay towards a Real Character and a Philosophical Language.* Bishop Wilkins classifies all the ideas to be expressed in words under forty categories, with subdivisions, called genera, differences and species. The

system seems founded on an antithetical arrangement; "Thus," he says, if "*Da* stands for *God*, then *Ida* will signify an *idol;* if *Dab* be *spirit*, *Odab* will signify matter, or *the body;* if *Dad* be *heaven*, *Odad* signifies *hell*. The numerals he expresses thus:—Popal, 10; pobar, 100; pobam, 1,000; poban, 100,000.

"If men," says the Bishop, "would consent upon the same way or manner of expression as they do agree in the same notion, we should be freed from the curse of confusion of tongues with all its unhappy consequences. This can only be done either—1. By enjoining some one language to be universally learned and practised, which is not to be expected till some person obtains the universal monarchy; or, 2. By proposing some such way as by its facility and usefulness, may invite and engage man to the learning of it."

That Leibnitz had also directed his thoughts to this subject is certain, for Fontenelle alludes to it in the following terms:—

"Among various subjects, each of which would suffice for the eulogium of any other person, there is one of a nature wholly different from the rest; we mean the project he had conceived of forming a philosophical and universal language. Of Wilkins and Dalgarno, who had each undertaken the subject, he said, in a conversation he had with Boyle, that he did not think that these great men had hit upon the right plan; that they had not discovered the true character, the most subtle instrument which the mind can employ. These characters ought to resemble as much as possible those of algebra, which are very simple and expressive, without

superfluity or equivocation. He also speaks of an alphabet of human thoughts."

In the memoirs of Francis Horne appears a notice of a society projected by a Duke of Somerset, Lord Webb Seymour, and other philologists, for the construction of a universal language. Nothing, however, came of it.

The latest attempts to realise the idea of a universal character were made in this country by the Rev. E. Groves, and Mr. Edmonds.

Mr. Groves'* plan comprehends both a written and vocal language. In the written language he proposes, 1, That each word should be expressed by a single character, which should be so contrived as to be easily expressed in type work. 2. That every written character should be expressed by a distinct monosyllabic sound. 3. That there should be as many sounds as characters.

The proposed universal language to consist of a series of vocal sounds connected with a corresponding series of written characters, each sound forming a monosyllable, and each character being capable of being delineated by a single act of the pen. The sound of every word is to be formed by two consonants, with an intermediate vowel or diphthong.

Mr. Edmonds† retains our own alphabet, which he enriches with some additional marks, and follows to a considerable extent Bishop Wilkins' classification. The following extract from Mr. Edmonds' work, which,

* *Pasilogia*, Dublin, 1846.
† *A Universal Alphabet, &c.* Griffin, London, 1856.

whatever may be said as to its practical utility, is certainly very ingenious, may give the reader some faint idea of the new language.

"Beasts are divided into six sorts. The first are whole-footed, which is denoted by *oo*. Thus *injoo*, divided into its visible elements, will consist of *inj*, beast; and *oo*, which joined, becomes injoo, whole-footed beast. Again, *oi* signifies cloven-footed, which joined to *inj*, becomes injoi, cloven-footed beasts. Again *o* signifies clawed, but not rapacious; which joined to *inj* signifies clawed, but not rapacious beast. So *a* signifies, in this connexion, rapacious of the cat kind; and *il* rapacious of the dog kind; while *is* signifies oviparous. These joined to *inj* become *inja*, *injil*, *and injis*; beasts of these three kinds."

But while the formation of a universal language seems beset with apparently unsurmountable difficulties, and while it is even doubtful whether, if formed, it would tend to advance mental progress, it is unquestionable that a uniformity of character in printing and writing would greatly tend to facilitate and favourably to influence the intercourse between peoples speaking different languages. The attention of philologists and missionaries has, therefore, in modern times, been chiefly directed towards the formation of a universal alphabet which does not, like universal language, necessarily interfere with the ideas expressed by the characters, and being thus freed from one of the chief difficulties, is more easily attainable.

An important movement in this direction was made in London, about five years ago, when some of the

most eminent English and continental philologists attended a conference at the request of Chevalier Bunsen. Although the discussions did not at that time lead to any practical result, they are very interesting in a linguistic and ethnological point of view, as will appear from the subjoined account of the proceedings on that occasion.

*Conference at Prussia House.**

On the invitation of Chevalier Bunsen, the Prussian ambassador, a number of gentlemen met at Prussia House, London, in the months of January and February 1854, in order to take into consideration the question, whether or not a uniform system of expressing foreign alphabets could be agreed upon. Besides Sir John Herschel, Sir C Trevelyan, Professor Owen, there attended many representatives of the Missionary, the Asiatic, and Ethnological Societies. Drs. Pertz, Lepsius, and Max. Müller were also present at most of these meetings.

In stating the objects of the conference, Chevalier Bunsen, who presided, said :—

" Two great phenomena urge the importance of a universal alphabet—the advance of comparative philology, and the missionary movement all over the globe ; and two great principles are required—a physiological for a basis and a practical for the application.

* Abridged and condensed from a report of the London Conferences regarding the Universal Alphabet in *Chevalier Bunsen's " Christianity and Mankind."*

"1. Are we enabled by the present state of physiology to define the nature of each sound so as to reduce it to its proper place?

"2. Is the system of expressing these sounds, alphabetically, consistent, so as to render it universally practicable?

"If such a uniform alphabet could be fixed upon, it might serve to bring the 150 millions of the Indian empire nearer to their rulers, and their rulers nearer to them.

The alphabet would also render it possible, not only for the scholar of profession, but for every friend of ethnology and comparative philology, to transcribe and read the sounds, whether published at London, Paris, or St. Petersburgh; and why not at Pekin or Nankin? The first step needful for 360 millions composing the Chinese nation, before entering into the system of the common civilization of mankind, will be their adoption of an alphabet of sounds to which, as experience has already shown, even that most abnormal language can be reduced."*

The following resolutions were subsequently adopted as bases of a further understanding:—

"1. The first basis of the alphabet must be a physio-

* The recent events in China have given additional importance to this subject, but whether it can ever be realised, seems very doubtful, for the Chinese reprobate the idea of changing their characters for foreign systems unknown to their forefathers. And, according to Dr. Morrison, they are right; for, unless they gave up their monosyllables, they might almost have no written language at all; as, if written alphabetically, it would be wholly unintelligible. The written characters assist their meagre monosyllables—an alphabet would destroy them.

logical one; that is to say, every sound must be defined physiologically before it can claim its own graphic exponent in the general alphabet.

"2. This physiological system, offering an infinite variety of possible sounds, must be checked by observation. The comparative philologist must determine which are the typical sounds employed in the various manifestations of human speech; and after discovering which sounds are primary or secondary, he must fix the number of letters requisite for a universal alphabet.

"3. The graphic system built upon this double basis, must be rational and consistent, and must answer the purposes of reading and writing, with a particular regard to printing. The graphic system should in the first place be drawn from the *Roman Alphabet*. After this is exhausted, we should employ, in the second place, modifications of the Roman types. Greek letters can only come in, by way of exception, Arabic, Russian, or fanciful types must be excluded altogether.

"4. The scientific alphabet thus constructed, is to be considered as the *Standard Alphabet*, to which all other alphabets are to be referred, and from which the distance of each is to be measured.

"The following letters to which no objection has been raised are to form part of the standard alphabet:

K (gutturalis tenuis) as in *kirk*.
G (gutturalis media) as in *go*.
T (dentalis tenuis) as in *town*.
D (dentalis media) as in *down*.
N (dentalis nasalis) as in *no*.
P (labialis tenuis) as in *post*.

B (labialis media) as in *boat.*
M (labialis nasalis) as in *man.*
Y (palatalis semivocalis) as in *yes.*
L (dentalis semivocalis or liquida) as in *low.*
R (lingualis semivocalis or liquida) as in *row.*
W (labialis semivocalis) as in *will.*
S (sibilans dentalis asper) as in *sin.*
Z (sibilans dentalis lenis) as in *zeal.*
F (sibilans labialis asper) as in *find.*
V (sibilans labialis lenis) as in *veil.*
H (spiritus gutturalis asper, according to Müller, or spiritus faucalis, or pectoralis, according to Lepsius) as in *hand.*

"There was a unanimous feeling that it would be useless and impossible to attempt to find for each possible sound a different graphic sign; but that a sufficient number of typical signs being formed, each nation or province would attach to them their own shade of sound in their own language nearest to it.

"Professor Max. Müller then proposed to represent foreign alphabets by the Roman, using italics for certain modifications of both vowels and consonants.

"Professor Lepsius proposed dots, accents, and lines, above or below, as diacritical signs.

"The italics were objected to, as being ugly; with regard to dotted or accented types, missionaries object that though when cast on one body, they have the advantage of looking better, they are not always at hand.*

* *See Lepsius' Standard Alphabet,* and *Max Müller's Froposal for a Missionary Alphabet.*

A final discussion having taken place between Professor Lepsius, and Professor Müller, Professor Wilson, Sir J. Herschel, and Sir C. Trevelyan, expressed it as their opinion that a definite agreement between the two contending systems appeared at this period impossible, and that they themselves did not intend to pronounce definitively for either. It was then resolved that the conferences should be renewed in London, or elsewhere, to arrive at a definite practical conclusion, after the whole had been submitted to mature deliberation.

CHAPTER XVIII.

DISORDERS OF THE VOICE

AND

DEFECTS OF ARTICULATION.

THE various organs of which our vocal and articulating apparatus is composed, are liable to a variety of idiopathic and symptomatic affections, which have only in comparatively recent times attracted that attention which the subject in our artificial state evidently requires.

Morbid States of the Vocal Organs.

The principal causes which may produce complete or partial loss of voice are:—acute or chronic inflammation of the mucous membrane which lines the pharynx and larynx; tumours and excrescences in the vicinity of the vocal organs; inflammation of the tonsils and the soft palate; atony or relaxation of the vocal

cords in consequence of over-exertion; hysteria and violent emotions.

Alcoholic liquors and various narcotics may also produce loss of voice. Sauvage mentions that some robbers in the environs of Montpellier made their victims drunk with wine mixed with an infusion of the seeds of the thorn-apple (*datura stramonium*), which rendered them, although fully awake, for two days unable to reply to any question.

Loss or suppression of voice (aphonia) is frequently confounded with speechlessness (alalia). This is an error; for a patient may, unless the loss of voice is complete, still be able to render himself intelligible by whispering, while on the other hand he may be capable of uttering a variety of sounds without possessing the power of articulation.

Several curious instances are on record in which aphony assumed an intermittent form. In the *mélanges de l'académie des curieux de la nature*, there is an interesting case of a young German, who, during fourteen years, only spoke from noon to two o'clock. Morgagni had a patient, ætat sixty, who became dumb every morning from seven to eight o'clock during a period of two months. Schmieder's patient, a girl sixteen years of age, remained speechless for a fortnight after the lapse of every three months.

Such anomalous cases, which sometimes resist the efforts of the physician for years, appear to result from the interruption or irregular supply of nervous influence.

Loss of voice, proceeding from pressure on the brain

or in the medulla, is a very serious and frequently fatal symptom.

As a sonorous and agreeable voice depends, to a considerable extent, on the healthy condition of the mucous membrane and the elastic tissues of the vocal organs, constantly exposed to an ever varying state of the atmosphere, it is not surprising that in our changeable climate disorders of the voice should be so frequent.

Being identical in structure thoughout its extent, an irritation in any part of the mucous membrane of the alimentary canal may, and frequently does, affect the functions of a distant part. Hence a disordered state of the organs of nutrition and intestinal canal is, in many cases, the sole cause of the functional derangement of the vocal organs.

The superior ligaments and the ventricles exercise a great influence on the quality of the voice, which manifests itself when the functions of these organs are interrupted. Whenever the mucous membrane of the superior ligaments is thickened, but little air can enter the ventricles, and the resonance of the voice is impaired. Again, if the ventricles are filled with viscid mucus, the voice appears muffled, though the vocal cords may be in a healthy condition. Should the secretion of mucus be too abundant, it will accumulate between the vocal ligaments, and cause a harsh and rattling tone; on the other hand, if the secretion be diminished, or the pulmonary air deficient in moisture, the voice becomes hoarse, and the tone loses its fulness, timbre, and resonance.

That the pitch and the timbre of the voice are, in sus-

ceptible subjects, frequently influenced by the hygrometric state of the atmosphere, is no doubt true; but that during a cold moist state of the atmosphere, the voices of singers become invariably, as has been asserted, lower by two or three notes, and regain their pitch when the air becomes dry, is somewhat problematical.

The following case is probably an isolated one:— "When Grassini came to this country, owing to the change from the air of Italy to that of England, her voice became one octave lower; after singing for two or three seasons, her natural voice returned, but it had lost its attractions with the low notes, which had obtained her the greatest applause."*

The treatment for disorders of the voice must, of course, vary according to the nature of the affection.

Counter irritation by blisters, tartar-emetic, &c., may be sufficient in some cases, but the most effective remedies are those applied to the parts. The great influence of affections of the generative organs on the voice is known to every practitioner, and consequently all such cases arising from sympathetic influence of distant organs, as from an atony of the abdominal viscera, require a considerable modification of the course to be pursued.

Inflammation of the tonsils, in consequence of a cold, generally yields to an antiphlogistic treatment, unless it be the result of a strumous diathesis, when an anti-scrofulous treatment is required.

* *Transactions of the London Medical Society*, 1846.

Dr. Bennati, for many years physician of the Italian Opera House, in Paris, observes, in his prize essay,* that the extirpation of the tonsils and excision of the uvula, besides the accidents to which they give rise, rarely succeed in restoring the voice; and that even in the most favourable cases the parts retain a great irritability, so that changes in the temperature, or any unusual exertion suffices to produce angina.

Dr. Bennati was one of the first practitioners who cured the elongation of the uvula, which excites a continued desire to swallow, impeding speech and proper modulation, by cauterization with nitrate of silver.† He used an instrument which he called "porte-caustique double," by which the uvula was cauterised simultaneously in front, behind, and laterally. The voice recovers, soon after the operation, its timbre and force, nor is any great irritability left in the parts concerned.

The following gargle is recommended by this physician in affections characterised by an atony of the organs, modifying the voice, accompanied by difficulty of motion of the superior constrictor muscles of the pharynx:—

"Powdered alum, one drachm.
Decoction of barley, filtered, ten ounces.
Syrup of white poppies, half an ounce.

Gargle three or four times daily. The quantity of alum may, if necessary, be gradually increased."

* *Recherches sur le Mécanisme de la Voix Humaine.* Paris, 1825.

† Sir C. Bell was probably the first surgeon who ventured to apply the lunar caustic to the parts in throat affections; at any rate, he did so in 1812, as appears from certain hospital reports.

The gargles should, for fear of a relapse, be continued for some time, at longer intervals, and in smaller doses.

Frictions on the anterior region of the neck, with the following mixture, are also very useful in such cases.

"Extract of belladonna, twelve grains.
Spirit of Camphor, 4 ounces. Mix."

In illustration of the success attending his treatment, Dr. Bennati cites a variety of cases, of which the following, relating to a celebrated cantatrice, is not the least interesting:

"Madame Malibran," says Dr. Bennati, "in consequence of a cold, complained of pain in the throat presenting the following symptoms:—Mucous membrane inflamed, covered with aphtae; deglutition, especially of liquids, very painful; lancinating pains; aphony complete; impossibility to whisper without pain; neither fever nor cough. Ordered gargles of alum. Next day the mucous membrane of the pharynx and palate presented quite a different aspect, the aphtae had disappeared, the redness had diminished, deglution was less painful, could speak without any pain. Ordered a larger quantity of alum, and more frequent gargles. Next evening, Malibran could sing with the greatest success, *Ninette* in *La Gazza Ladra;* nor could any body believe that she was in the state described."

A different treatment was successful in the following case:—

A young lady was affected, in consequence of a cold, with complete loss of voice, which had already existed for three months, notwithstanding all remedies which were tried. Dr. Gerner, supposing the cause of the

affection to be a relaxed state of the mucous membrane of the trachea, at last cured the patient completely in three days, by the inhalation of ammoniacal vapours, disengaged from a mixture of a solution of muriate of ammonia and carbonate of potass.*

Dysphonia,† or impaired voice, varies from the slightest degree of a disordered voice to the severest and painful degree of hoarseness. Besides the variety of causes which have already been noticed as exciting aphony in general, inordinate or too long continued exertion of the vocal organs is one of the most common causes of failure and disease in these parts. Speakers and singers of all kinds are subject to it, though not in the same degree.

The frequent occurrence of throat affections among preachers has given rise to the designation of *dysphonia clericorum*, or "The clergyman's sore throat," as it is somewhat incorrectly translated. The reasons why clergymen should be more subject to throat ailments than schoolmasters, barristers, and other public speakers are obvious enough. It is certainly not owing so much to over exertion, as is frequently imagined, for barristers, teachers, lecturers, and members of parliament use their vocal and articulating organs to a much greater extent. One reason seems to be, that the vocal organs of many clergymen, after remaining in nearly a quiescent state during the whole week, are called into violent action on Sundays only; but sudden transitions

* *Zeitschrift für die gesammte Medicin.* Feb. 1839.
† *Dys*, difficult; *phone*, voice.

from repose to activity generally affect the organ concerned injuriously.

The author is also, from observation, led to believe that affections of throat are less prevalent among dissenting than among Church of England ministers. The reason of the former being more exempt, seems to be, that dissenters commence preaching when very young; their organs undergo, therefore, a proper training; they preach, also, more frequently—sometimes every day, by which all sudden transitions are avoided. Another important circumstance mustalso be mentioned; which is, that dissenters do not generally *read* their sermons. In reading the head stoops, the larynx is compressed, and the free action of its muscles is impeded. The extemporaneous preacher, on the contrary, raises his head, throws back his shoulders, and thus gives the muscles of the throat fair play. Anyone who tries the experiment soon finds that half an hour's reading from a book affects his voice more than an hour's extemporaneous speaking: unless, indeed, he has by practice acquired the art of reading in such a manner that it differs but little from speaking.

Another cause which has an injurious effect must not be forgotten. It is well known that nothing so much fatigues the voice as singing in an unnatural tone; but though it may not be quite so evident, still it is injurious to speak as preachers frequently do, in an assumed tone, in order to impart solemnity to their sermons.

In cases of raucity of voice, the consequence of inordinate exertion, by which the vocal organ has been

deprived of its moisture and the ligaments of the requisite mucus, the following remedy will be found as effective as it is simple :—Chew a small crust of bread so long until it is converted into a fluid pultaceous mass: swallow this slowly, and wash it down with a little tepid water.

Some singers and speakers complain that they feel fatigued, and that their voice becomes grating, even after moderately exerting their vocal organs. This alteration of the voice, which at first is merely transient, becomes gradually permanent.

The experience which the author has had in the treatment of defective articulation—in many cases the result of a faulty mode of breathing—have long convinced him that the fatigue and the raucity of the voice is also intimately connected with the respiratory process; for he invariably found that the pupil, after being taught how to manage the breath, not merely improves in his articulation, but acquires the power of sustaining continued vocal efforts, without feeling the voice fatigued or altered.

In order to explain these results, it must be considered that the act of breathing presents itself under three different aspects, which are distinguished as clavicular, costal, and abdominal respiration.

In the first type, the first or superior ribs, the collar bone (clavicle), and the breastbone are acted upon. In the second type, the inferior ribs are mostly displaced; while in the third type the abdominal walls rise and fall chiefly by the action of the diaphragm.

As most of the cases of voice-affections which have

come under the author's observation, have presented the clavicular type, which requires the participation of many muscles, his first efforts have always been directed to induce the patient to abandon the clavicular mode of breathing, and to adopt, as far as possible, the abdominal respiration, in which, comparatively, but few muscles are concerned.

The importance of this preliminary step, founded on experience and physiological principles, has lately been confirmed in a memoir on this subject, presented by Dr. Mandl to the French Academy of Medicine.*

"A comparative study," says Dr. Mandl, "has shown that the struggle between the inspiratory and expiratory muscles in the process of phonation, is least during the abdominal expiration. The obvious reason is that, besides the diaphragm, there are but few other muscles in action; and all that is required is the displacement of the abdominal viscera, which are readily yielding; the larynx generally remains in its normal position; the glottis neither enlarged nor constricted, nor are the vocal cords inordinately relaxed or stretched."

"The expiration necessary for the production of sound finds, therefore, the principal organs in the natural position and tension; and the production of sound may be effected without much resistance, and consequently without great fatigue."

"In clavicular respiration, on the contrary, the vocal struggle is much greater, as many muscles participate

* *Comptes Rendus*, 1855.

in this respiratory process; the superior portion of the thorax is more fixed and less flexible; the larynx is depressed, the glottis enlarged, and the vocal cords relaxed during inspiration; whilst these parts must, for the production of sound, be placed into diametrically opposite conditions."

"The opposite traction which the larynx experiences, if in singing, the clavicular respiration is resorted to, renders the emission of sound more difficult and fatiguing, and may in time produce in the intrinsic muscles of the larynx loss of contractility, a lesser or greater degree of atrophy, and loss of the voice. The physician should, therefore, insist that clavicular respiration should be guarded against in teaching singing.

"It may also be stated that singers who use the first register generally feel fatigued in the diaphragmatic and thoracic region, while those who resort frequently to the second register feel most fatigue in the fauces, and especially in the soft palate."

The impairment of the voice in advanced age is owing partly to the diminished supply of nerve-force, and partly to the ossification of the cartilages of the larynx. The change usually commences first in the thyroid, secondly in the cricoid, and lastly in the arytenoid cartilages. The epiglottis is generally unaffected, and ossification of the arytenoid cartilages, the most essential of the vocal organ, is very rare. This change occurs later in life in the female than in the male.

Repeated attacks of laryngitis, or inflammation in the

neighbourhood of the larynx may produce ossification in the cartilages at a comparatively early period.

Impediments of Speech.

Defective articulation varies in degree from a slight hesitation in utterance to the severest form of stuttering, in which, not merely the respiratory, vocal, and facial muscles, but even those of the limbs, are thrown into violent action.

The Greeks designated these affections, by naming them somewhat indiscriminately, *psellismos* (faltering); *traulismos* (lisping); *asapheia* (indistinctness); *ischnophonia* (feebleness of voice); and *battarismos** (stuttering). Among the Romans, a stammerer—or any one having an impediment of speech, seems to have been called *balbus;* a lisper, *blaesus;* and Cicero uses the term *haesitantia linguae.*

In English the terms stammering and stuttering are, in most works, loosely employed to denote all degrees of defective utterance, whereas, as will be presently shown, stammering and stuttering essentially differ, not so much in degree as in kind.

Stammering may be defined a difficulty, or a total inability properly to enunciate certain *elementary* sounds. This difficulty does not, as frequently asserted, occur only in the pronunciation of consonants; but extends also to the vowels. As the organs of articulation are

* According to some, the term is derived from Battos, a King of Cyrene, who was a great stammerer.

less concerned in the enunciation of the vowels, the causes of this defect must be chiefly sought for in the larynx, the pharynx, in a defective or improper use of the soft palate, or in an abnormal condition of the nasal cavities. Thus, if the nostrils, during enunciation, are open when they ought to be closed, or closed when they ought to be open, there will arise that defect called *rhinophonia* or *balbuties nasalis*, (*See Nasal Timbre*).

The defective pronunciation of the consonants may, like that of the vowels, extend to a few or to all the consonantal sounds.

Perhaps the most difficult of all consonants to articulate properly is *r* (page 268). Children at first pronounce *l* instead of it, until they gradually learn to master the sound. Some never acquire it; thus Alcibiades, who, from inability or affectation, always substituted *l* for *r*, was called by Plutarch *traulotes*. Owing to imitation, there are whole provinces who cannot, or do not, pronounce the lingual *r*, but substitute the guttural *r*, known in this country as the Newcastle *burr*. The same defect or beauty (for after all it is a matter of taste) is observed in the south of France, especially in Marseilles; and in central Germany.

The Chinese, who have no *r* in their language, replace it by *l*, while the Japanese are said to possess no *l*, and would thus pronounce London *Rondon*.

Stuttering differs essentially from stammering; inasmuch as the stutterer, though he may be able to pronounce the elementary sounds of speech individually, finds it difficult, owing to the sudden stoppage of the sound, fluently to pronounce certain syllables

or words. The greatest difficulty in this respect is experienced by the stutterer in the pronunciation of the explosives *k*, *t*, *p*, and of their medials *g*, *d*, *b*., or of *m;* because in articulating these elements, the buccal cavity requires to be closed and immediately to be re-opened for the following vowel. But instead of doing so, the stutterer not only allows the respective organs to remain in the same position longer than is requisite, but he rather compresses the cavity, in order to force out the sound. The expiration becoming thus retarded, all the muscles concerned in vocalisation and articulation are thrown into an inordinate action. The difficulty of the stutterer is, therefore, much lessened when the word commences with a vowel, in which case the aperture of the buccal cavity is wider. The stutterer can thus easily pronounce *ib*; but were he to attempt to pronounce successively buy, buy, buy, he would pronounce, as the London butchers on a Saturday night, b-b-b-b-buy.

As this affection is in some cases intermittent, disappearing for hours and days, or increasing and diminishing according to the mental or physical condition of the sufferer, the author thinks that stammering might be further distinguished from stuttering by considering the former as partly idiopathic, and the latter as chiefly a symptomatic affection.

The statistics with regard to the number of persons labouring under defective articulation are very imperfect, and it is to be hoped that the Registrar-General will, at the next census, supply some information on this subject.

Colombat (*Tableau synopt. et Statistique*) assumes

that there are in France less than 6,000 stutterers, or about 1 in 5,000; he admits, at the same time, that he only includes those whose defects were well marked.

Others assume 2 in 1,000, which appears to be much nearer the mark. There is no doubt that females are, from the flexibility of their organs, less subject to defective articulation that males. Many complicated cases of psellismus in females have, however, within the last few years come under the author's own observation, and he has reason to believe that the number of female stutterers is greater than is generally assumed.

The causes of Psellism * are either organic, dynamic, or psychical.

Among organic causes must be classed—cleft palate, hare-lip, abnormal conditions of the tongue, soft palate, and uvula. It is chiefly in such cases that the surgeon's assistance can be of any material use. Dynamical causes are:—affection of the brain and spinal cord, nervous debility, solitary vices, spermatorrhœa, &c.

Psychical causes are:—all depressing emotions; want of energy and self-control; but especially imitation, which is frequently the sole cause of psellism.

The benefit which attended surgical operations for wry-neck (*torticollis*), and squinting (*strabismus*), induced Prof. Dieffenbach to try their effect in cases of severe psellism. The first operations which he performed were so successful, that sanguine hopes were excited that at length a radical cure had been

* Psellism is here used as a generic term for all impediments in speech.

discovered for an affection so distressing. No wonder that Dieffenbach soon found a host of imitators, who, though possessed of less skill, now considered the buccal cavity as a fair field for making experiments with the knife. Those professors who had hitherto successfully treated severe cases of stuttering by mere moral means, naturally raised their voices against these useless mutilations. but as they did not belong to the medical profession, they were considered as mere interlopers, who had no right of giving an opinion on the propriety of surgical operations. Time, however, has shown, that the objectors to the knife were right after all; for Dieffenbach, at last, candidly confessed, that the hopes which he entertained had not been realised. Of eighty persons upon whom he had operated, by far the greatest number had reaped no benefit. Some, who had apparently been cured, had experienced sudden relapses. He, therefore, did not latterly recommend any operation for stuttering, except in some exceptional, isolated, and very severe cases.

That benefit has been derived from this heroic treatment, in some instances, may be readily explained, by the fact that any severe operation influences for a time the articulating and vocal organs.

As the articulation in early infancy may, from its indistinctness, be called a natural stammer, parents are generally unable to distinguish between a mere defective enunciation of certain syllables, and a vicious articulation; and it is not until the seventh or eighth year, when psellism manifests itself in an unequivocal manner, that their attention is called to the defect,

which the parents hope may spontaneously decline on approaching manhood—a hope which, with some exceptions, is rarely realised. As the proper means for remedying the evil at the proper time are neglected, the disorder increases, and becoming permanent, impairs the general health and spirits, and mars the worldly prospects of persons so afflicted. Parents, therefore, must be reminded that the earlier they place children thus afflicted under the care of an experienced teacher, the greater chance is there of the evil being eradicated.

Considering that Psellism arises from causes so multifarious, and exhibits so many varieties, that long practice is required to form a correct diagnosis, and adapt the treatment to each individual defect, it must be inferred, that it is not easy to lay down definite rules to meet every possible case. The author has, elsewhere, in a monograph on the subject,* given a synopsis of the various systems for the cure of impediments of speech which have from time to time been promulgated; and he cannot but here reiterate his sincere conviction, that little or no benefit is derived by patients from the mere perusal of written rules. There may be some, who possessing sufficient self-control, perseverance, and energy of character, may succeed in freeing themselves from certain defects, but the great majority will not only fail in their attempts at a self-cure, but actually increase their disorder, by contracting other bad habits Few, indeed,

* *On the Cure of Stammering.* Third Edition. Longman and Co., 1857.

have ever applied to the writer for relief, who had not previously read and tried the multifarious plans of cure proposed by a great variety of writers.

Nothing, in fact, is more certain than that in cases of severe faults of articulation, a self-cure is of rare occurrence. Such persons absolutely require, for a certain time, the constant aid of an experienced teacher, who having traced the cause of the evil, adapts the treatment accordingly, until he restores to the patient the power of rightly using his vocal and articulating organs.

The author cannot deny himself the gratification of quoting here the advice given to parents, by Dr. Edw. Warren, of Boston, a gentleman who occupies a prominent position among the medical practioners of the United States, and who has devoted much of his attention to defective articulation.

"Seek out," says Dr. Warren, "a person who has experience in the treatment of impediments of speech. Place him under his care; and if he is benefited, do not remove him and think to perfect the cure yourself. Three months is a very short time for him to remain under the superintendence of an instructor; six months is better, and where it is practicable, he should remain a year. If this interferes with his other studies, it is of no consequence; he will derive benefit enough to compensate for the loss. The age I would fix upon for this trial, should be from eight to twelve years. Some children, however, are as mature at the former age as others at the latter. At this period, the loss of a year's study may, perchance, be a gain.

"If he meets, there, others who are afflicted as he is, it is all the better; he will no longer look upon his case as a peculiar one; and if he sees others whose impediments are worse than his, it will give him additional courage.

"Whatever method may be employed for the relief of this affection, no permanent advantage will be gained in the majority of cases, unless resolutely persevered in for one or two years."*

* Extracted from an essay "*On the Cure of Stammering by Moral Means,*" by Dr. E. Warren, M.D.. which appeared in the American *Journal of Medical Science.*

CHAPTER XIX.

DEAF-DUMBNESS (*Surdo-Mutitas.*)

AND

MUTEISM.

The acquisition of speech is no doubt the result of imitation, but of an imitation which is really marvellous; for the process of articulation is not merely very complex, but mostly hidden from sight. Hence the instinctive attempts to imitate articulate sounds are, at first unsuccessful, until at length, the infant hits, as it were, by chance, upon the proper mode, and by repeated efforts, gradually acquires the control over the requisite contraction of the muscles concerned in the production of speech-sounds.

Congenital deafness, as well as the loss of hearing, before the power of articulation is acquired, is followed by dumbness, as the individual is thereby precluded from imitating vocal and articulate sounds.

The power of speech already acquired, may be lost again if complete deafness supervenes at an early

period, especially if the afflicted abandon the use of their vocal organs for communicating their thoughts. The following is an interesting case in point:—

Dr. Kitto became deaf in his twelveth year, in consequence of a fall from a ladder.* Before his fall, his enunciation had been remarkably distinct; but after that event, his voice was so altered as not to be easily understood; he was told that his voice had become very similar to that of one born deaf and dumb, but who had been taught to speak. Although he had no physical pain in the act of speaking, he felt a strong repugnance to use his vocal organs, and for many years, habitually expressed himself to others in writing, so that he came to be considered as both deaf and dumb—an impression which, from disuse of the vocal organs, he was in a fair way of justifying, but for the following incident. In his first voyage to the Mediterranean Dr. Kitto met, on board, a German physician and other well-informed persons, who, perceiving how the matter stood, entered into a conspiracy, in which the captain joined, not to understand a word otherwise than orally throughout the voyage. "In this," says Dr. Kitto, they persevered to a marvel; and as I had much to ask, since I had not before been at sea, I made very great progress with my tongue during the six weeks voyage.

"At first, strangers could rarely understand me without difficulty; but under the improvement which practice gave, my voice was so much bettered, that the instances in which it was not readily understood

* *The Lost Senses.* Ch. Knight, 1845.

gradually diminished; and at the present day, I rarely find even a foreigner to whom my language is not clear."

Deafness, though congenital, does not necessarily deprive the individual of the power of acquiring speech by the medium of the other senses, and therefore the heading of this chapter, which implies a distinction between deaf-dumbness and muteism, is, though not generally attended to, founded on facts; for, as will be shown in the sequel, a person may be dumb but not deaf, or deaf but not dumb.

The Organ of Language.

All physiologists agree, that the brain, as the organ of the mind, exercises a considerable influence on language or audible thought. In many cases of idiocy, the patients are dumb, although their organs of hearing are unimpaired, and their vocal and articulating apparatus in a normal condition. Muteism clearly arises in these instances from a deficiency of ideas. Many idiots do not speak because they have little or nothing to say. On the other hand, in many cases of nervous and mental excitement, there may be observed an increased activity of the vocal and articulating organs. Hysterical patients, at times, chatter away with the utmost rapidity, especially when talking of their affections. Many lunatics are also very loquacious when questioned on their fixed ideas; and some talk incessantly, as if compelled by an internal impulse.

In most of these cases, it is not difficult to detect the predominating ideas, although the words are as in delirium, but little connected, as the rapidity of the muscular motions outsteps the judgment. These affections, which have received the names of *Lallomany* and *Kenologq* (empty talk) are, no doubt, the result of cerebral excitement, and are thus opposed to that state of muteism which arises from cerebral inactivity.

When, however, we meet with mutes possessed of considerable intelligence, whose hearing and organs of speech are apparently unaffected, the question naturally arises, whether there be in the encephalon, a *special* organ of speech; and, if so, where it is located.

Dr. Gall, the founder of phrenology, conceived that there was such an organ of language, which had its seat in certain convolutions in the anterior lobes of the brain, and that the size of the organ was indicated by a certain protuberance of the eyes. Such "ox-eyed" persons are, according to Gall, generally distinguished by a powerful verbal memory, and a great flow of language.

It is remarkable that Sir Benjamin Brodie, though a stanch opponent of phrenology, appears inclined to assume the existence of a special organ of speech. In his character of Ergates, *(Psychological Inquiries)*, Sir Benjamin refers, in support of this theory, to two cases which had come under his own observation. One case was that of a boy, who was unable to speak at the age of thirteen; the other, of a girl eleven years old, who laboured under a similar defect. In both cases, the hearing and the intellectual faculties were seemingly perfect.

Mr. R. Wilde* also quotes a remarkable case of a boy aged ten, who hears well, is intelligent, and understands what is said to him, but who makes no attempt at articulation. When he wishes to attract attention, he utters a loud, sharp, and bark-like sound. His organs of speech are, so far as can be observed, well-formed, as are those of hearing.

From another valuable document, by the same gentleman,† we learn that of the total number of mutes in Ireland, 334 were dumb but not deaf. Among this class, 115 were idiotic, 45 paralyzed, 43 both paralytic and idiotic, and 131 were dumb only, without any other apparent defect.

It would, however, be rash to draw from such comparatively rare cases of muteism, without any other visible organic defect, any conclusion as to the existence of a separate organ of speech in the brain. If there be a special organ of speech, what explanation can be given in the following curious cases, in which the loss of power was confined either to particular languages, or to certain parts of speech? Are we to assume a particular organ for every language and its parts?

A gentleman is mentioned by Dr. Beattie, who, after a blow on the head, lost his knowledge of Greek, and did not appear to have lost anything else.

A frequent modification consists in putting one name for another, but always using the words in the same sense; thus a gentleman affected in this manner, when

* *Practical Observations on Aural Surgery*, Dublin, 1853.

† *Statistics of the Deaf and Dumb in Ireland*, by W. R. Wilde, Esq., Assist. Census Commissioner for Ireland.

he wanted coals put upon the fire, always called for paper, and when he wanted paper, called for coals; and these words he always used in the same manner.

Dr. Gregory used, in his lectures, to mention the case of a clergyman, who, while labouring under an affection of the brain, spoke nothing but Hebrew, the last language he had acquired. Dr. Prichard mentions an English lady, who, in recovering from an apoplectic attack, always spoke to her attendants in French, as she had actually lost the knowledge of the English language. This continued about a month.*

The celebrated Dr. Broussonet lost, after a slight apoplectic attack, the power of pronouncing substantive nouns, whether in French or Latin. Thus, when he wished to pronounce apple, he described it by its qualities. When the noun was shown to him written or printed, he immediately recognised it, but he had no power to designate it spontaneously.

Cuvier relates, in his lectures, a similar case of a person who had only lost the memory of substantive nouns, but could pronounce all adjectives, &c.†

Pathological Researches.

Mr. Aequiel *(Bulletin Med. de Bordeaux)* gives the following as the results of his investigations with regard to affections of the encephalon as influencing the power of speech :—

* See Dr. J. Abercrombie, *On the Intellectual Powers.*
† Rochoux, *Recherches sur l'apoplexie..*

"1. Inflammation of the investing membranes do not influence speech, provided the brain is unaffected.

2. Disorganisation of one or both anterior lobes, cause a partial or entire loss of speech.

3. Speech is affected by any disorganisation in a central part of the brain.

4. The posterior lobes do not influence the power of speech unless the internal part is affected.

5. Alterations on the surface of the corpora striata, also influence speech.

6. The tubercula quadrigemina appear likewise to affect speech.

7. Changes in the pons varolii cause the partial or entire loss of speech.

8. The fornix, the septum, and the cerebellum do not seem to exert any influence on speech."

A communication on the same subject, addressed to the French Academy of Medicine, by Mr. Bouilland (*Gaz. Med. Paris*, 1848) contains the following conclusions:—

"1. In those cases where the partial or entire loss of speech depends on disorganisation of the brain, the seat of the affection is generally in the anterior lobes.

2. All deep seated alterations in the anterior lobes cause a partial or entire loss of speech.

3. Derangements in the middle and posterior lobes do not perceptibly influence speech provided the anterior lobes are unaffected."

It would thus appear that while, excepting the cerebellum, the septum, and the fornix, most parts of the encephalon affect more or less the power of speech;

the chief influence is exercised by the anterior lobes of the brain. And such a result might have been expected; for without adopting either the phrenological principles, and the inferences drawn from them, it cannot easily be denied, that the perceptive powers, and the reflective faculties in general much depend on the development and the healthy state of the anterior lobes of the brain, and that such being the case, their influence on language must be paramount. We may also fairly assume that cases of muteism without deafness or idiocy, are not the consequence of the absence of a special organ of speech in the brain; but result either from an abnormal condition of some part of the vocal apparatus, which may defy detection, or from a derangement either in the nervous centre, or of the conductor-nerve supplying the nerve-force to the organs of articulation.

Physical Condition of Deaf-mutes.—The vocal and articulating apparatus of deaf-mutes is generally perfect at first: but the organs of which it is composed are, from want of use, very liable to be arrested in their development. The tongue becomes frequently thick and deficient in mobility; the soft palate shrunk, and the uvula becomes either too large or too small. The chest remains narrow; the sternum and its muscles are, owing to want of exercising the lungs, not fully developed; hence deaf-mutes are very liable to pulmonary affections. Another peculiarity which manifests itself in early infancy, is a certain dragging of the legs and feet in walking, which sometimes becomes permanent.

In many instances of defective articulation, and partial

muteism, there exists, according to Mr. Wilde, a pecular narrowness and a unnatural height of the palate immediately behind the upper incisors.

Intellectual Capacity of Deaf-mutes.

The limited intellectual capacity of deaf-mutes is, no doubt, chiefly to be ascribed to an imperfect method of tuition, combined with the shortness of instruction. That they are capable of a high intellectual development is proved; for we find among them, men distinguished in various departments of science, literature and art. Mr. Louston, a young historical painter, carried off, in 1842, the gold medal at the Paris Exhibition. A pupil of Girodet, Mad. Robert, is equally distinguished for the delicacy of her works. Paul de Wigan is highly distinguished as a mathematician. Ferdinand Berthier, Claude Forestier, and others, take high rank as authors; while Pellissier and Chatelain are much esteemed as poets.

Massieu, a pupil of the Abbé Sicard, enjoyed a high reputation in France for his readiness in answering impromptu questions with great skill and precision. Thus, on being, on one occasion, asked by Sir James Mackintosh, "Does God reason?" Massieu immediately replied "Man reasons because he doubts; God knows all things; he never doubts, and therefore never reasons."

Whether this and other remarkable answers to perplexing questions were really extempore, that is to say, delivered on the spur of the moment, without much

cogitation, or whether they were not rather the result of previous discussions on these topics with his teacher, the Abbé Sicard, can scarcely be decided. The probability is in favour of the latter assumption.

That persons who have become deaf after the habit of articulation had been acquired, should be able to write poetry, is not surprising, as the notions of quantity and rhythm may remain after the reminiscences of sound are lost; but it is certainly remarkable to find a poet deaf from his birth, such as John Carlin, a deaf-mute, of New York, who is besides, highly esteemed as a successful miniature painter. He appears to know nothing of articulation, nor can have any perception of rhythm and rhyme, and yet he constructs both correctly. Some of his lucubrations have appeared in the *New York Commercial Advertiser*.

The Abbé de l'Epée was of opinion that deaf-mutes might be taught everything except music. It appears, however, that a deaf-mute, the son of General Gazan, has cultivated music with considerable success, and has even written a treatise on the formation and distinction of sounds.

In a recent number of the *Ocean of Brest*, it is stated, that there is now, residing in that town, a deaf-mute, named Mozer, a native of Ratisbone, in Bavaria, who has taught himself Latin and a dozen other languages of Europe, which he writes with facility, and who besides, makes the most difficult arithmetical calculations with astonishing correctness and rapidity.

It must, however, be admitted that while some deaf-mutes excel in the acquisition of knowledge, and, as

artists, there are but few instances of any so afflicted, who have given evidence of the possession of much original power.

Deaf and Blind.

Cases of persons born deaf and blind are exceedingly rare, and most interesting in their bearing upon the question of innate ideas.

Hence, the interest which the case of James Mitchell excited at the time, in the scientific world. James was born in 1795, at Ardclach, in the Highlands, deaf and blind. As he grew up he displayed such a remarkable acuteness of touch and smell, as to be able by these, to distinguish strangers, and various articles which belonged to him and other persons. Sir Astley Cooper, Mr. Saunders, and Mr. Wardrop operated upon him, in 1810 with little or no success. The reader will find a full account of this remarkable case in the third volume of Dugald Stewart's *Philosophy of the Human Mind.**

The last accounts concerning James, obtained by Sir W. Hamilton, from Miss, and Lieutenant Mitchel, contain nothing interesting as to his intellectual progress.

Lieut. Mitchel writes from Nairn, where the family now reside, "James is now, (July, 1854), about fifty-nine years old; is stout and healthy, gives little or no trouble, further than satisfying his necessary wants; his conduct is most affectionate towards his sister, and

* *The Collected Works of Dugald Stewart*, edited by Sir W. Hamilton. Edinburgh, Constable, &c., 1854.

apparently he is at all times happy and contented . . . The sight of the eye operated upon in 1809, is quite gone. He is as fond of smoking as ever, and so systematic in all his habits, that he has his regular number of smokes at home every day, in addition to what he may get from his numerous acquaintances in the town."

Still more remarkable in a psychological point of view, is the case of Laura Bridgman, born 1829, at Hanover, New Hampshire. There is, however, no evidence that she was born deaf or blind. It appears that in her second year she had a violent fever, and was attacked by an inflammation and suppuration of the eyes and ears, by which, not only hearing and vision was destroyed, but taste and smell considerably impaired. Fortunately, when she was seven years old, she attracted the attention of Dr. Howe, the Director of the Institution of the Blind of Boston, who received her into the Asylum, in 1837.

Her instruction, it seems, commenced by making her acquainted with different articles to which labels were attached, by means of the raised letter alphabet, after which the individual letters were given to her, and she was taught to spell the name of the respective articles.

Dr. Howe's first report upon this case, in 1841, is very interesting. "Hitherto," observes the Doctor, "the process had been mechanical, and the success as great as teaching a dog a variety of tricks. The poor child sat in mute amazement, and patiently imitating everything her teacher did; but now the truth began to flash upon her—her intellect began to work—she perceived that there was a way by which she could

herself make up a sign of anything that was in her own mind, and show it to another mind, and at once her countenance lighted up with a human expression; it was no longer a dog or a parrot—it was an immortal spirit, eagerly seizing upon a new link of union with other spirits! I could almost fix the moment when the truth dawned upon the mind."

Subsequent accounts of the expansion of her intellect and her rapid progress are contained in the *Reports of the Perkins Institution and Massachusset Asylum for the Blind.*

The great success which attended this case, must be partly attributed to the circumstance that Laura enjoyed for years the almost exclusive attention of a competent person, and partly to her mental constitution. Dr. Howe says, in his report, that he found her with a well-formed figure, a large well-shaped head, and the system in healthy action. No teaching, indeed, could have produced so favourable results, had she not been a person of very superior mental endowments, so that she was able to fly where others are obliged to creep.

The following is, probably, the only instance on record of a blind deaf-mute having acquired the power of speech.

Mr. Hirzel, director of the Asylum for the Blind at Lausanne, heard of a young man, Jakob Meystre, born 1826, who was deprived of hearing in his eleventh month, and of his sight by the discharge of a gun when eight years of age. On visiting him, in 1845, when Meystre was about eighteen years old, Mr. Hirzel became interested in him, and caused his admission

into the Asylum at Lausanne. He followed nearly the same plan, which was so successful in the case of Laura Bridgman, and began to instruct him by means of raised letters. The great progress made by young Meystre, induced Mr. Hirzel to try whether he could not make him speak.

"Having placed," says Mr. Hirzel, "one of Meystre's hands on my chest, and the other on my throat, I pronounced the vowel *a*, making the deaf-mute sensible of the expiration, and induced him to imitate it." The experiment succeeded: but it took a long time before he had mastered the vowels. The consonants appear to have caused him much less trouble, for he learned them in three months. The first word he could articulate was *ami*. His first sentences consisted of a substantive and an infinitive; as "Friend hear; teeth bite." In eighteen months he began to form proper sentences.*

Spontaneous Recoveries.

In the twenty-fifth volume of the *Philosophical Transactions*, 1707, a Mr. Martin relates, that Daniel Frazer, of Strahrig, some six miles from Inverness, continued deaf and dumb from his birth, until the seventeenth year of his age, when he was taken ill of a violent fever. Some weeks after his recovery, he perceived a motion in the brain, which was very uneasy

* *Froriep's Notizen.* Oct. 1849.

to him, and afterwards he began to hear, and, in process of time, to understand speech. This naturally disposed him to imitate others, and attempt to speak. The servants (he was for eight years in the family of the Countess of Crawford) were much amazed to hear him, and some run away; he was not understood for some weeks afterwards. Mr. Martin left him in service at Morpeth in 1707.

The Dumb Philosopher or Great Britain's Wonder, published in 1719, by the celebrated Daniel Defoe, purports to be a "faithful and very surprising account, how Dickory Cronke, a tinner's son, in the county of Cornwall, who was born dumb, and continued so for fifty-eight years, came to his speech some days before he died."

Another remarkable instance of spontaneous recovery is related in the *Memoirs of the French Academy of Sciences*, for the year 1703.

A young man, born deaf and, consequently, dumb, began to speak when twenty-four years of age, to the great surprise of the inhabitants of Chartres his native town. On being questioned, the young man stated, that the change occurred four months previously, when all the bells of the town had been set a ringing, on the occasion of some fearful storms. Some time after, a watery humour was discharged from his ears, and he then could hear with both ears. During the three or four months he listened only, but used to repeat to himself the words he had heard. He, at length, began to speak, though, of course, very badly.

*Alleged Miraculous Recovery of Speech.**

"It is recounted that a deaf and dumb lad of sixteen, a native of St. Briac, near Dinan in Britany, has seen the Virgin, who appeared to him blazing in beauty and surrounded by stars. The celestial visitor opened the conversation by asking him his age, to which he replied "I don't know." She then told him, and proceeded to recount the whole history of his life, and a variety of other circumstances within his knowledge. She concluded by saying, "hereafter you shall speak like any other person; meet me to-morrow night, and I will tell you some wonderful things." The boy was faithful to the tryst, and the Virgin then pointed out to him three mysterious letters in the tail of the comet, and explained that they symbolise prophecies of events to come. He is not, however, at liberty to make known the things that were told him until the expiration of a year from the date of the vision. The boy now speaks and hears perfectly well.

Such is the story which, according to the *Union Malouine et Dinanaise*, the natives of St. Briac are ready to prove upon the hide of any sceptic."

The reader will observe that no particulars whatever are given. No person of repute vouches for the fact; and it is not even stated whether the lad was born deaf and dumb, or whether deafness supervened at a later period after the power of articulation had been acquired.

* From the *Times* of the 12th of October, 1858.

That, in certain favourable cases, the dormant energy of the auditory nerve or of the nervous centre, may be roused, is undeniable. The cures which were effected by Prince Hohenlohe, including those which still occur at shrines and holy wells are, no doubt, chiefly the result of a revulsion in the nervous system under the influence of mental excitement and religious enthusiasm. The hand of an executed malefactor passed over a wen of a faithful patient was, in many cases, quite as effective as the royal hand of Charles the Second in curing glandular enlargements of his loyal subjects. Hence in most nervous affections, unlimited faith in the skill of the physician and the means prescribed, generally lead to a successful issue.

To this class belongs the incident related by Herodotus, that a son of Crœsus, who was dumb, suddenly recovered his speech, on seeing a Persian about to kill his father. Powerfully moved with fear and agony, the son cried out "Man, kill not Crœsus;" and from this moment he continued to speak.

Assuming, then, the reality of these cases, it is evident that both deaf-mutes must have previously possessed the power of speech; for, though it is within the range of possiblity that a person born deaf may, under an effective stimulant suddenly acquire the sense of hearing, it is not imaginable how he could at once become possessed of the faculty of speech, a power which can only gradually be acquired.

Recovery of the power of Speech by Galvano-puncture and Electricity.

Dr. Camino (*Gazette Med.* Paris 29, Janv. 1848), states, that Rosa Pinto had, in 1813, lost her speech from a fright, so that she could not articulate a single syllable. On the 21st of May, 1836, galvano-puncture was applied, when she perfectly recovered. She continued to speak with such zeal and fluency, as if she had been anxious to make up for lost time.

The Dublin Hospital Gazette, Feb., 1856, reports a case treated by Mr. Flamant, of Strasbourg, and communicated to the Paris Academy, by Mr. Sedillot. The patient had, from a sudden fright, been deprived of voice and speech. Hearing was unaffected. The tongue was retracted, the apex pointing to the roof. Various plans of treatment were tried during a period of twelve years without benefit. The principal extrinsic muscles of the tongue, as well as the muscles of the larynx appeared paralysed. At length electricity was applied. After the third application, speech was restored, but not the voice, which only gradually came back. There are a good many cases on record which have yielded to electricity.

Occlusion of the Larynx without Muteism.

That the loss of the tongue does not necessarily prevent articulation has been already noticed (see tongue), but that the occlusion of the larynx should not

induce perfect muteism seems incredible, but for the subjoined well authenticated cases.

"Leblanc, ætat 32, veterinary surgeon, condemned to hard labour for life for false coining, cut his throat with a razor, and made an incision between the thyroid and cricoid cartilages without, however, dividing the large bloodvessels. The edges in time united and speech was restored. He made a second attempt, and the new incision was made on the cicatrice of the old. Assistance was immediately given, but the healing process presented, this time, the peculiarity that, while the external portion of the wound became cicatrized, a small membrane, presenting radiating fibres was forming in the internal edges of the wound, sending forth branches towards the lateral part of the air tube, tending to close it altogether. An effort made by the surgeon of the military hospital to destroy this false membrane failed, and in order to prevent suffocation it became requisite to insert a cylindrical slightly bent metal tube, about three inches long, between the thyroid and cricoid cartilages. Leblanc, though obliged to speak in a low voice, articulated sufficiently well to be heard at a certain distance. It was, however, observed that he required to make great and painful efforts in the labial, buccal, and lingual regions. How was speech effected in this case? Unquestionably by the movements which the air experienced from the muscular contractions effected in the mouth."*

* *Memoires de la Societé des Sciences de Lille*, by Dr. Begin.

Serres relates an analogous case of a convict at Toulon, who having cut his throat, the superior part of the larynx became obliterated, yet he spoke, though in a low voice, by means of a reservoir of air, which he, as in whispering, formed at the superior part of the pharynx.

*Statistics of Deaf-muteism.**

The first time any inquiry was made to ascertain the actual number of deaf-mutes in Great Britain was at the Census of 1851. From the results of this inquiry, which has been published, it appears that the total number of the deaf and dumb in the United Kingdom is as follows:—

	Number of Deaf and Dumb.	Population.	Proportion.
England	9,543	16,738,695	1 in 1,754
Ireland	4,747	6,552,324	1 „ 1,380
Scotland	2,155	2,888,742	1 „ 1,340
Wales	771	1,188,914	1 „ 1,542
Islands in the British Seas	84	143,126	1 „ 1,704
Total	17,300	27,511,801	1 in 1,590

This average of 1 in 1,590 approximates to that of the whole of Europe, which according to the latest returns is said to be 1 in 1,593.

The proportion varies, however, in a marked degree in different localities and counties. Thus, in Hereford-

* See *Journal of The London Statistical Society*. March, 1853, and June, 1855.

shire there is 1 person deaf and dumb in 1,054 inhabitants, while in Huntingdonshire the proportion is 1 in 3,016; that is to say, for one deaf and dumb in Huntingdonshire there are three in Herefordshire.

In Scotland the proportion in the Northern Counties is 1 in 1,156, and in the Southern Counties 1 in 1,480. In the four provinces of Ireland the proportions are:—

Leinster	1	deaf and dumb	in	1,474
Connaught	1	,,	,,	1,499
Ulster	1	,,	,,	1,318
Munster	1	,,	,,	1,317

In France there were in 1852, 29,512 deaf-mutes in a population of 35,783,170, giving a proportion of 1 in 1,212. The disparity in the proportions of deaf and dumb in the departments seems greater than that exhibited in different counties of Great Britain; for according to a report published in a French periodical the proportions vary from 1 in 686, and 1 in 691, in Corsica and the Upper Rhine, to 1 in 2,515 in the departments of the Lower Seine. These variations are so striking that they can scarcely be relied upon, especially as it is known that idiots are frequently included in the deaf and dumb returns. Thus, the great ratio of deaf and dumb in Switzerland, Baden, Sardinia, and other mountainous countries, is now accounted for by the number of idiots and Cretins, which are included in the return from these parts.

Similar errors were made in some returns in this country; thus, in the number of twenty-three in the

Colchester district are included nineteen inmates of the Asylum for Idiots, Essex Hall.

The official accounts of Prussia inform us, that in 1849 there were 11,973 deaf-mutes in a population of 16,331,187, exhibiting a proportion of 1 in 1,364.

From Luxembourg, Wurtemberg, Tuscany, Bavaria, Belgium, and Holland, the returns are favourable in this respect, the average being 1 deaf-mute in 2,209 inhabitants.

It is computed that there are in Europe, 180,000; and about 600,000 deaf-mutes in the whole globe.

The proportion of male deaf-mutes from all causes, exceeds the female; congenital, 100 males to 75 females; acquired, 100 males to 90 females.

Causes of Deaf-muteism.

Although many physiologists dissent from the popular opinion that the influence of fright, aversion, and other emotions of the mother during pregnancy, produces congenital malformation in the fœtus, there are many well authenticated caes in support of this doctrine.

Muteism is certainly in many cases owing to hereditary taint: but while it manifests itself in members of families derived from a common stock, it is rarely transmitted in a direct line. Thus, it is stated in the returns of the Hartford Institution, U. S., that out of ninety-one instances, where both parents were deaf-mutes, there were only four cases in which the children were similarly affected. Exceptional cases were, how-

ever, noticed in the last census. One instance occurred in the county of Cavan, Ireland, when the disease was transmitted direct for three generations—the grand. father, the father, and four of the family being all deaf and dumb.

The number of deaf-mute children in the same family is sometimes very great. A table, published in the last Report of the London Institution for the Deaf and Dumb, gives a list of 23 families containing 160 children, of whom not less than 105 are deaf and dumb.

In one family, eight out of ten children were deaf and dumb; in another, out of six, five were so. In four families all the children were mutes.

With regard to the influence of the locality, it is not a little singular that muteism prevails more in rural districts than in townships, and less in flat than in mountainous parts.

That the intermarriage of near relations is, in many respects, objectionable, has long been insisted upon by physiologists; and that it is one of the chief predisposing causes of muteism has been proved to demonstration by the results of the census. The particulars of 154 cases of deaf-dumbness, were procured out of the Irish returns; and it was found that the parents of the afflicted were related in the degrees of first, second, and third cousins.

As the sense of hearing scarcely exists at birth, and as it is not until the third or fourth month that children become sensible of, and capable of distinguishing sounds, the information derived from parents or friends as to whether the person was born deaf, cannot be depended on. Few are willing to admit the fact of con-

genital deafness; others are really not aware that the child was deaf; as many, though deaf to distinct sounds, are sensible of vibrations, such as those of a piano, &c.

Education of Deaf-mutes.

The questions whether the born deaf are capable of high intellectual development, and of acquiring the power of articulation, have long been settled in the affirmative. Experience has shown, that children congenitally deaf, can be made to speak, and that with those who have acquired this power, subsequent instruction is more successful.

A Mr. Dubois, who became deaf in early infancy, but who now speaks with considerable facility, has published a tract (*Cause du Mutisme chez les sourds*), in which he contends, that the deaf are only mute because they have not been forced to hear and to speak. He recommends, therefore, that parents should speak to their deaf children just as if they heard, and not by signs.

Dr. Philippe (*Journal de Médecine de Bordeaux*), endorses Dubois' opinion, and says, that we must *compel* the deaf to hear by constant loud speaking, and that all kinds of noises, provided they are not too intense, are beneficial in exciting and improving the auditory apparatus.

The condition of the uneducated deaf-mute, is, indeed, most deplorable. Gifted, like other human beings with mental capacities and moral feelings, he appears, unless

rescued, doomed to live in a state of isolation. His calamity seems greater than that of the born blind; hence, the latter is frequently cheerful and contented under his affliction—the deaf-mute is rarely so. The lullaby of his mother does not beguile his pains in infancy, nor is he in manhood cheered by the prattle of his own offspring.

"Is there anything on earth so engaging to a parent, as to catch the first lispings of his infant's tongue? or so interesting as to listen to its dear prattle, and trace its gradual mastery of speech? If there be any one thing arising out of my condition which more than another fills my heart with grief, it is *this*—it is to *see* their blessed lips in motion, and to *hear* them not; and to witness others moved to smiles and kisses by the sweet peculiarities of infantile speech which are incommunicable to me, and which pass by me like the idle wind."*

Happily, compassion has, in modern times, given way to active sympathy; for it is found that the education of the deaf and dumb is not only full of interest for the philosophical inquirer, but also important in its relation to mental philosophy and the science of language.

Among the notables who have interested themselves on behalf of the long neglected deaf-mute, must be first mentioned Pedro Ponce (Petrus Pontius) a Spanish Benedictine monk, who died about 1585, and Juan Pablo Bonet, also a Spaniard, and contemporary

* *The Lost Senses.* By Dr. Kitto.

of Ponce. To Bonet belongs the glory of having published the first work on the education of deaf-mutes.*

The discoveries of Ponce were promulgated at Leyden in 1622 by Valesius, physician in ordinary to King Philip II, of Spain.†

The first English treatise on the education of deaf-mutes, entitled *Philocophus or the Deaf and Dumbe Man's Friend*, by John Bulwer, surnamed *the Chirosopher* was published in London, 1648.

Thirteen years afterwards (1661), appeared George Dalgarno's remarkable work, *Ars Signorum*, which has already been noticed in a previous chapter, and in 1681 his *Didascalocophus, or the Deaf and Dumb Man's Tutor; to which is added a Discourse of the Nature and Number of Double Consonants.* Oxford 1680.

This work is full of practical instructions on the education of deaf-mutes, containing also the first scheme of a finger or hand alphabet. The works of this long neglected author have been reprinted in 1834 for the Glasgow Maitland Club.

The celebrated Oxford professor, Dr. J. Wallis, who obtained great reputation by his *Treatise on Words, or of the Formation of Sounds*, is said to have largely availed himself of Dalgarno's labours, without the least acknowledgement.

Johann Conrad Amman, of Haarlem, ranks high as an educator of the deaf and dumb. The practical rules,

* *Reduccion de las letras, y arte para ensenar a hablar a los mudos.* Madrid, 1620-4.

† *Francisci Valesii de üs quae scripta sunt physice in libris sacris, &c.* Cap. 3, *Surdi loqui docti.*

laid down in his works* to make deaf-mutes speak, are, with little alteration, followed at the present time.

The first teacher of deaf-mutes in France appears to have been the Spanish Jew, Rodrigo Pereire, who commenced giving instructions at Rochelle, in 1745. If the report of a committee of the academy of sciences is to be trusted, his success seems to have been great, indeed, for his pupils could not only speak, but evinced great intellectual power. Louis XV granted him a pension of 800 francs, and appointed him royal interpreter in 1775. He rarely took more than three pupils at a time, and required for their education a period of from four to five years. Nothing is known of the method which he pursued.

The first institutions for the education of the deaf and dumb in Europe, and probably in the world, were founded in Paris by the Abbé de l'Epée, about 1760, and by Heinicke, in Leipzig, about 1770.

Charles-Michel de l'Epée was born at Versailles in 1712, and was educated for the Church. In 1755 he, by mere accident, became acquainted with two girls, twin-sisters, and deaf-mutes. Touched with compassion, he resolved to devote himself to the instruction of the deaf and dumb. He studied Spanish in order to understand Bonet's work, noticed above. Encouraged by his success in teaching, he at last founded an establishment at his own expense.

A ragged deaf and dumb boy, picked up in 1773 in

* *Surdus loquens, seu methodus qua, qui surdus natus est loqui discere possit.* Amstelodami, 1692.
Dissertatio de loquela, &c. Amst. 1700.

the streets of Peronne, was afterwards proved to be the son of a rich nobleman, and by M. de l'Epée's exertions, legally acknowledged as Count Solar, and re-established in his rights. This romantic incident gave rise to Bouilly's drama, *l'Abbé de l'Epée*, which was long popular on the stage. De l'Epée's favourite wish —the foundation of a national institute at the public expense—was only gratified two years after the Abbé's death, which took place in December, 1789. His last work, *La Véritable Manière d'Instruire les Sourds et Muets*. Paris, 1754, has been translated into English, and published in London, in 1801.

Samuel Heinicke, the founder of the first German institute, born at Nautschütz in 1729, served in his youth in the army of the Elector of Saxony, when he was taken prisoner in the seven years' war. Heinicke subsequently studied at Jena, and having already, as a soldier, been occupied in educating a deaf-mute whom he found in a family where he was quartered, he determined to devote himself to the task, and soon acquired such a reputation, that he founded an institution at Leipzig, of which he was nominated director by the Elector of Saxony. Heinicke died 1790, and was the author of several important works on the education of deaf-mutes.*

The principal means at present employed in educating the deaf and dumb are the following:—Natural and

* *Beobachtungen ueber Stumme und die menschliche Sprache.* Hamburg, 1778. *Ueber die Denkart der Taubstummen, &c.* Leipzig, 1783. *Wichtige Entdeckungen und Beitraege zur Seelenlehre, &c.* Leipzig, 1786.

methodical signs; written language; dactylology, or the finger alphabet; lip-reading and articulation.

Articulation and reading on the lips seem to have been generally adopted in the earlier period of the art, and is now chiefly employed in the German schools.

In France the system introduced by the celebrated Abbé de l'Epée to teach the deaf and dumb consisted principally of natural and methodical signs.

Both methods have had ingenious defenders. A uniform system, combining the advantages of both methods is as yet a desideratum.

In Great Britain, articulation and reading on the lips, adopted by Braidwood and his successors, has undeservedly fallen into disuse. In the London Institution alone it still seems to occupy a prominent part.

The reasons given why articulation and lip-reading is abandoned in many schools are:—that the time and labour spent upon them is productive of little real benefit; and that the motions of speech are not only partly invisible, but so similar to each other, that to read well on the lips requires, on part of the pupil, great quickness of perception, so that few mutes can do more than make out some of the words spoken in common discourse, and guess at the remainder.

The returns with regard to the education of the deaf and dumb in England seem to be very defective, as they neither give a correct account of the number of schools nor of the pupils. This information has, however, been supplied from the population tables, which are generally correct. The latest reports show that

there are about eighteen schools in the United Kingdom, containing 1401 pupils. In England and Wales, 854; Scotland, 259; Ireland, 288. The number of institutions in different parts of the world is computed at about 200.

The first school for the instruction of the deaf and dumb in Great Britain was probably that established in Edinburgh in 1768, by Thomas Braidwood, who in 1783, removed his academy to Hackney, where, it is said one of his first pupils was a son of Charles James Fox. Braidwood died in 1806, but his establishment was carried on by his widow until 1816.

The first school for *gratuitous* instruction was founded in 1792 in Bermondsey, through the instrumentality of the Rev. John Townsend; and it is from this establishment that the largest institution in the world for the education of the deaf and dumb, that in the Kent Road, sprung, which gives accommodation to about 300 pupils.

In this great establishment, articulation forms a prominent branch of instruction, as will appear from the following passage, extracted from the report of this year:—

"All the children are taught to speak artifically, and are thus enabled, in many instances, to be understood by those in constant intercourse with them. By this means every pupil, of ordinary capacity, is made to comprehend what is immediately addressed to him by carefully observing the motion of the lips of the speaker." As a proof of the advantages derived from teaching articulation, the following letter is

quoted, addressed to the Secretary by the Rev. J. Armitage Rhodes, of Leeds:—

"Horseforth Hall, near Leeds,
"August 26th, 1842.

"Sir,—I beg to inform you that Miss Armitage, of East Parade, Leeds, died on Sunday last; her name must, therefore, be withdrawn from your List of Subscribers. She was born deaf and dumb; but by great attention, could understand whole sentences by observation of the lips of the speaker; and could *speak* whole sentences, so as to be understood. This faculty was of the greatest value during her later life, and especially during her sickness, as she could not then make use of her *fingers*. I venture to press this matter upon your consideration as one of the utmost importance in the teaching of the deaf and dumb.

"I am, &c.,
"J. A. Rhodes."

"Instances," continues the Report, "are very rare in which organic defect precludes the possibility of articulation; and experience has shown that the mental incapacity of those pupils who cannot thus be taught to speak, renders them equally incapable of benefiting by the general course of instruction.

The following is the method pursued in teaching the deaf-mute to speak:—

The mute has placed before him a board or a card, upon which are written or printed the five vowels, A, E, I, O, U. The teacher then pronounces each of these vowels slowly and distinctly. The pupil is made to closely observe the position and motion of the lips

and the tongue, and to feel at the same time with his hands the actions of the respiratory muscles, and especially the contraction of the muscles of the throat and neck during articulation. The learner is thus made, as it were, to feel and to see the sounds as they issue from the mouth of the teacher. As there are but few, if any, deaf-mutes, who do not possess the power of uttering inarticulate sounds, the learner by imitation gradually masters the vowel sounds one by one, after which he passes to easy combinations, such as ma, ba, mo, bo, se, and is subsequently led, step by step, to read on the lips of the speaker, and to reply in favourable cases in articulate words, or in writing, which he has simultaneously acquired.

CHAPTER XX.

CULTIVATION AND MANAGEMENT

OF THE

VOICE.

It has already been observed that the relative strength or weakness of the voice, depends partly on the capacity of the lungs, and the general condition of the vocal apparatus, and partly on the number of muscles thrown into action. Experience has also proved that the respiratory organs and the vocal muscles are not only as susceptible of a high degree of development as other portions of our frame, but even to a higher degree. The cultivation of the voice is, however, required on grounds altogether irrespective of the art of singing or public speaking. It is indirectly, perhaps, the most important branch of physical education; for the amount of vital power depends chiefly on the health and vigour of the respiratory process, the regulation of which must be the first step in the cultivation of the voice.

Parents are not generally aware how much might be effected by a proper mode of physical training in those constitutions where the chest is narrow, indicating a predisposition to pulmonary disease. In all such cases regularly repeated deep inspirations are of paramount value. On account of the elasticity of all the parts concerned, the expansion of the chest is in early childhood easily effected; the capacity of the lungs is increased, and the tendency to disease is counteracted.

There should be a sufficient pause between the acts of in- and expiration. In order that children should perform these chest-exercises slowly, regularly, and effectually, they require to be carefully watched, guided, and encouraged; for they soon get tired of them when left to themselves. Even adults will derive considerable benefit if, immediately after rising, they regularly, for some time, take deep inspirations, in order that the whole of the lungs may be properly inflated; and then retain the breath as long as possible. The body must be in an erect position, and the shoulders thrown back. It may also be observed that these exercises are best performed in the open air, or, at least, in a well ventilated room, the windows being open for the time.

Vocal Gymnastics among the Ancients.

The discipline for the formation and improvement of the voice among the Athenians was so comprehensive that, as we are informed by Roman writers, not less than three different classes of teachers were employed

for this purpose, viz. :—the *vociferarii*, *phonasci*, and *vocales*. The object of the first class seems to have been to strengthen the voice, and to extend its compass; the office of the second to improve its quality, so as to render it full, sonorous, and agreeable; while the efforts of the third, who, perhaps, were considered as the finishing masters, were directed to the proper intonation and inflection.

The *vociferarii* certainly did good service to their pupils by practically training them in set exercises in loud exclamations, in order to impart force and compass to the voice. Loud vociferations in the open air, whether standing, walking on the plain or up hill, against the wind, is certainly, with due caution, one of the most effective means of strengthening the voice. Those who are on the seaside cannot do better than to imitate the practice of Demosthenes, who remedied the weakness of his voice by loud recitations on the sea shore.

Children, when at play, are instinctively given to vociferation, and there is nothing more absurd than to bid them to play in whispers. Those who cannot bear the noise of children, in which all their fun consists, are certainly not fit to be about them.

The value of loud vociferation in strengthening the lungs is also proved by the fact that itinerant costermongers, street criers, ballad singers, although constantly exposed to the vicissitudes of the weather, are neither much liable to colds nor to pulmonary affections.

After the first great requisite—the training of the

respiratory and vocal organs concerned in the production of voice—has been attended to, we may commence with its cultivation and improvement.

Singing.

Speech and song-voice, though originally produced in the same manner, chiefly differ in this respect: that in speaking, the voice does not rest long enough on any note; and as the vibrations, therefore, reach the ear at unequal intervals, the mind is unable to appreciate them as a musical note; while in singing the voice rests sufficiently long on any musical note, for the ear to be struck by vibrations which succeed each other at distinct intervals. Thus Mr. Faber (*See* Speaking-Machines) struck the keys rapidly when he intended to produce articulate sounds, but when he wished the machine to sing, the finger remained on the key for some time.

Speaking also differs from singing, that in the latter the transitions from one note to another are more frequent, and require the co-operation of all the vocal and respiratory muscles; hence, singing cannot be so long continued without fatigue as speaking, during which the larynx is less moved, and a great part of the work is performed by the articulating organs.

The physical requisites for a singer are: a large, well developed chest; healthy and elastic lungs; neck muscular but not too long; thyroid gland sufficiently developed to receive the disposable blood, and to sus-

tain the exercise of the voice without fatigue and hoarseness; nor should it be in a state of hypertrophy, in which case the gland presses upon the veins of the neck and renders the movements of the larynx more difficult. The larynx should be above the medium size. The two portions of the thyroid cartilage, but especially the arytenoid cartilages, must be perfectly symmetrical. The vocal cords should be perfectly elastic, and exactly opposite to each other. The ventricles of the larynx and the frontal sinuses must be large, to give resonance to the voice.

As the tongue, the soft palate, and the uvula exercise a paramount influence on the modulation of the voice, these organs must be in a healthy condition as to volume, texture, and mobility. It has been observed that the thinner and more moveable the soft palate, the more flexible the voice. Persons possessing a thick velum have generally a stronger but less flexible voice. That the hard palate, the nasal passages, the lips, and the teeth should be well formed, is obvious.

The influence of the organs above the larynx on the voice is well demonstrated in the following remarkable case of a person who was said to possess a double voice.

Dr. Pettigrew, some years ago, exhibited, on the occasion of a lecture, a person of the name of Richmond, who sung two airs, each as a duet, synchronously. After a careful examination, the lecturer, assisted by Mr. Bowman, came to the conclusion that the two tones were thus accomplished:—The voice was, of course, single, and produced in the larynx; the current

of vibration was split, as proved by the flame of a candle—the bass notes being modified in the upper part of the pharynx and nasal passages; the treble was produced by the tongue forming with the arched roof of the palate a tube open by a small aperture in front, the tube being altered in length by the nicest adjustment of its muscles, these latter acting more perfectly from the fixature of the os hyoides and the roof of the mouth.

Education of the Ear.

The perfection both of song and speech-voice, depends to a great extent on the condition of the organ of hearing.

That there are many individuals, who, though their hearing is acute, cannot properly appreciate musical sounds, is as true as that there are persons who cannot distinguish colours. But it is *not* true that *all* who sing false have absolutely no ear for music; for many not only know that they are singing false themselves, but immediately detect it in others. It is clear that in such cases it cannot be the ear which is in fault; the defect, therefore, must arise from a want of control over the actions of the vocal apparatus.

Like every other organ of sense, so must the ear be trained to improve its capacity for the nice perception of the relations of sound. The education of the ear ought to be attended to in early childhood. It may perhaps, create a smile when it is asserted that musical, like moral education, commences at the cradle, but

such is the case. The lullaby of a nurse, possessing a well-trained melodious voice is, in fact, an effective and practical music lesson; while a false singing attendant, with a harsh and grating voice, may so injuriously affect the aural perception and vocalization of the child, as to disqualify it from ever arriving at any excellence as a musician or singer.

In order, however, to become an effective singer, the possession of a good ear and a fine voice, though essential requisites, is not sufficient; as the art of regulating the voice, and of managing its powers can only be acquired by making it a particular study, and by long and close application.

The old Italian masters almost concentrated their attention in teaching a perfect delivery of the voice, which consisted in adapting, as nearly as possible, the respiratory motions to the emissions of the voice, so as to bring out its natural power without much effort. Pachierotti, a famous *maestro*, said to his pupils—*Mettete ben la voce, respirate bene, pronunciate chiaramente, ed il vostro carto sarà perfetto.**

The following anecdote, though frequently quoted, is sufficiently interesting to deserve repetition.

Porpora, one of the most illustrious masters of Italy, having conceived a friendship for a young pupil, exacted from him the promise that he would persevere with constancy in the course which he should mark out for him. The master then noted upon a single page of ruled paper, the diatonic and chromatic scales, ascend-

* Deliver well your voice, respire properly, articulate distinctly, and your singing will be perfect.

ing and descending; the intervals of third, fourth, fifth, &c. This eternal page occupied master and pupil until the sixth year, when the master added some lessons in articulation and declamation. At the end of this year the pupil, who still supposed himself in the elements, was much surprised when Porpora said to him, "Go, my son, you have nothing more to learn; you are the first singer of Italy, and of the world." The master had spoken the truth, for this singer was Caffarelli, the greatest singer of the eighteenth century, who amassed a sufficient fortune to buy a Dukedom.

"When" says Fetis (*Music Explained*) "there were good schools in Italy, the *metter la voce*, or delivery of the voice, was a study of several years. Hence, the singers of the eighteenth century were not less renowned for their power of expression than for the beauty of their mechanical performances. Some things are related of them, which appear fabulous at the present day."

"At moments, when Malibran avoided exaggeration, she gave us an idea of the old singers, who maintained during the whole of the part, that perfection which Malibran exhibited only at intervals."

The best time for practising the voice, is between ten and twelve in the morning, and from five to eight o'clock in the afternoon. To commence too early in the morning is injudicious; the secretion of mucus being more abundant about that time, the voice is thereby affected. It will, moreover, be found that the high notes are then not so easily produced. The duration of the lessons is also of some consequence. Children should never

be kept at the lessons longer than half an hour, nor adults longer than one hour and a quarter.

The pupils should receive their lessons and practice in an erect position. It is also of considerable importance to teach the pupils properly to open the mouth, and to place the tongue into the most favourable position for the production of the voice. The peculiar grimaces and contortions of the facial muscles, observable in many singers, are generally the consequence of negligence, and a habit acquired at the beginning of the lessons; though, in some few cases, these grimaces are the result of an abnormal action of the internal organs, to the movements of which the facial contractions correspond.

Tosi, a famous singing master of the eighteenth century, observes on this point, that the master should at the outset rigorously correct all grimaces and tricks of the head, body, and particularly of the mouth, which ought to be composed, rather inclined to a smile than to gravity; and that the first object should be to obtain the natural tone of the voice, whether it be *di petto* or *di testa*, in its purest state—that is to say, as it proceeds direct from the larynx without being modified in its passage by the throat, the nose, or the mouth. The partial emission of the voice through the nose, or choking it in the throat, constitute, according to this author, two of the most horrible defects in a singer, and are past all remedy if once grown into a habit.

False notes.—Besides certain imperfect and weak notes of the scale which require strengthening and correcting, most, if not all singers, have one note which

is constantly failing them. This note is the transition from the chest to the head voice, and stands thus at the upper extremity of the natural scale. The method employed to smooth this bridge, so that the break may not be perceptible, is to strengthen by exercise the respective faulty notes separately, so as to acquire the power of properly blending them.

Although there may be but few persons possessing all the essential requisites to become great singers, there are still fewer who cannot, by judicious cultivation, arrive at some excellence. There is no voice which may not, by judicious instruction and regular practice, be wonderfully improved in tone, strength, and compass. Much in this respect depends on the selection of the first instructor. As with many other branches of education, parents generally entertain the false notion, that *anybody* is good enough to teach the elements of an art; hence, the curious terms of "finishing masters," or "finishing governesses." The best instructor obtainable should be engaged to lay the foundation, otherwise the time of the "finishing master" will generally be taken up with the difficult, and frequently impossible, task of correcting errors in principle imbibed at an early period.

Preservation of the Voice.

The general rules for the preservation of the voice may be said to be substantially the same as those for the preservation of health, resting on the fundamental principle, to be temperate in all things. There are,

however, some particular points to be attended to, which the singer, to whom his voice is his fortune, must not neglect.

The apartments, especially the bedroom, should be dry, airy, and well ventilated.

The upper stories are much preferable to the ground floor. The dress of the professional singer ought to be light, and but moderately warm. Those who accustom themselves to wear overcoats are very apt to catch colds. That neither the chest nor the neck should be cabined and confined is sufficiently obvious.

The best preventives against catarrh are: daily ablutions with cold water, and hardening the body by exercise in the open air, regardless of the state of the weather.

Those who are unaccustomed to the use of cold water should begin the practice in summer.

Hot meat and liquids should be avoided, as in passing the fauces they injuriously affect the lining membrane of these parts. Alcoholic liquors and smoking are more injurious to tenor than to bass voices.

The preservation of the teeth is of considerable importance to the singer, as by their loss the resonance and the articulation suffer considerably.

The cultivation of a taste for music and the introduction of the art of music and singing as a branch of education in our elementary schools and popular institutions must be considered as one of the gratifying signs of the times. Indeed, the very men who, not many years ago, looked with something like dismay at the establishment of Mechanics' and Literary Institutions,

are now foremost in lecturing, not merely on the dignity of *labour*, but on the necessity of *recreation*.

Irrespective of the humanising effect of music, in its tendency of withdrawing the masses from the mere gratification of animal desires, singing is really a branch of public hygiène, as it may be regarded as a prophylactic against that insidious disease, consumption, which is the cause of nearly half the deaths that happen between the ages of fifteen and thirty-seven.

Speech-Voice.

The best voice adapted for public speaking is the barytone, or the middle voice, which is capable of various degrees of inflection, can be long sustained, and reaches farthest. A tenor voice becomes, under great exertion, a scream, and soon exhausts the speaker. Again, a bass voice is with some difficulty pitched high, and though in keeping during solemn exhortations, it becomes, when long continued, monotonous, and soon exercises a soporific power, the most dangerous quality of a voice. A perfect voice is a great attraction, and excites in the audience an immediate sympathy for the speaker.

The comparative ease with which a speaker goes through a discourse of some duration, depends much upon the pitch in which he sets out. If he commences with a voice too loud, or in too high a tone, he cannot easily rise higher; or, without forcing, swell his voice when the occasion and the sense require it. Expe-

rienced speakers generally commence in a low voice, in order to husband their forces.

The late Professor Wilson seems to have been eminently distinguished by, and not a little proud of, the possession of a splendid voice; as may be inferred from the subjoined colloquy between the Professor and the Ettrick Shepherd, when both these choice spirits were yet in their prime.

The quaint description of the positive and negative qualities of a good speaking voice is by far more graphic than any physiological definition possibly could be.

North. (Professor Wilson.)

"James, I love to hear your voice. An Esquimaux would feel himself getting civilised under it—for there's sense in the very sound. A man's character speaks in his voice, even more than in his words. These he may utter by rote, but his "voice is the man for a' that," and betrays or divulges his peculiar nature. Do you like my voice, James? I hope you do."

Shepherd. (James Hogg.)

"I wad ha'e kent it, Mr. North, on the Tower o' Babel, on the day o' the great hubbub. I think Socrates maun ha'e had just sic a voice—ye canna weel ca't sweet, for it's ower intellectual for that—ye canna ca't saft, for even in its aigh notes there's a sort o' birr, a sort o' a dirl that betokens power—ye canna ca't hairsh, for angry as ye may be at times, it's aye in tune frae the fineness o' your ear for music—ye canna ca't sherp, for it's aye sae nat'ral—and flett it cud never be, gin

you were even gi'en ower by the doctors. It's maist the only voice I ever heard, that I can say is at ance persuawsive and commanding—you micht fear't, but you maun lov't; and there's no a voice in all his majesty's dominions, better framed by nature to hold communion with friend or foe."*

The name of *orotund* has been given by Dr. Rush† to speech-voice in its highest condition. This voice is deep, full, strong, smooth, and has a highly resonant or ringing character. It is highly agreeable to hear; and being more musical than the common voice, is peculiarly adapted to set forth the beauties of epic and tragic compositions; it is possessed by actors of eminence.

The acquisition of this voice, which is, however, not to be used on common and familiar occasions, may, according to Dr. Rush, be effected by the following means:—The student must learn to explode all the vowel sounds with great suddenness and force. The explosion is to consist of short, abrupt, and single acts of coughing, forcibly made on each element, yielding up nearly the whole of the breath. The student should begin by coughing out the vowel *e*, as heard in *err*, and then substitute for it successively all the other vowels, coughing them out in the same manner. The explosion is the result of the previous closure of the glottis, the sound breaking forth from behind the occluded part. As the process of forcing out the breath to the seeming exhaustion of the lungs is apt to produce, at

* *Noctes Ambrosianæ, Blackwood's Magazine*, April, 1826.
† *Philosophy of the Human Voice.* Philadelphia, 1845.

first, giddiness of the head, the exercises must, if such be the case, not be continued too long. The pupil cannot be said to be in possession of the orotund voice until all the possible vowel sounds can be uttered with a sudden report like that of firearms, with strength and fulness of tone, and without any apparent effort preceding the explosion.

Without the least wish in any way to disparage the scientific value of Dr. Rush's interesting work, the author entertains serious doubts as to the efficacy of the coughing-out system for the acquisition of a full and melodious voice, being, from actual experience, convinced that in many instances, the *explosive* system produces injurious effects, especially when the respiratory and vocal apparatus is delicately organised. No such effects attend the *expelling* system. The difference between expulsion and explosion is simply this: that in the former, the glottis is first opened and then closed, while the contrary is the case in exploding the sounds. Thus in enunciating abruptly the interjection "ah!" the glottis must be first closed and the sound may be said to explode; but in producing the interjection "ha!" the glottis being first opened and then closed, the sound may be said to be expelled.

One of the best, and at the same time most exhilarating exercises in the expulsion of the vowel sounds, is to make the pupils regularly practise some of those laughing choruses, which occur in some operas. Care must, however, be taken that the laughter should be on all the vowel sounds as in *hah*, *he*, *ho*, *hu.*, *he* (as in *hen*).

The author is not aware that any writer has ever noticed the fact that we can only laugh in the simple vowel sounds. Thus it may be immediately detected that our *i*, as in *mine*, is a compound vowel, from the impossibility or difficulty of laughing in *hi* (long). The same test may be applied to any other compound vowel, whether diphthong or triphthong.

Training of the Articulating Organs.

Mr. T. Sheridan* has very justly observed that "A good articulation is to the ear in speaking what a fair and regular hand is to the eye in writing; and exactness in sounding the words rightly corresponds to the propriety in spelling."

Whatever may be the natural gifts, there must be discipline, or there may be ultimate failure. Just as the accomplished singer must have the complete control over all the muscles of the larynx and throat, so must the speaker have the mastery over all the movements of the articulating organs. Art can in this respect do more for the speaker than for the singer. A judicious discipline and daily practice, in the first instance, on the elementary sounds, and then in their multifarious combination, will not only tend to strengthen the organs, but conduce to a clear and distinct enunciation.

Dr. Rush complains that though we are taught the alphabet, we are not taught the real elements of

* *Lectures on Elocution.* London, 1762.

speech, as many vowels have no peculiar symbols, and nearly all the consonants are heard as syllables, and not as elements. The doctor, therefore, recommends the pupil in practising to pause after the initial sounds as heard in b-ay, k-ing, l-ove, so that in being pronounced singly, they may receive a concentration of the organic effort, however unusual and uncouth the sound may, in some cases, be to the ear.

Excepting as regards the enunciation of the *r*, which, by separate utterance may be improved to a greater degree than in the conjoined manner, the advantages of this method seem to the author more plausible than real, especially as it rests on the fallacy that any consonant can become perceptible as such, without its attendant obscure vowel sound.

Articulation is frequently confounded with pronunciation, though there is an essential difference between them; for a person may articulate well and pronounce badly. There appears to be the same distinction between articulating and pronouncing, as between stammering and stuttering. A good articulation consists in a proper enunciation of the elements of speech; pronunciation is a proper utterance of words and sentences. A correct pronunciation thus includes a correct articulation, the importance of which cannot be over estimated by anyone who aspires to become a public speaker; being as essential to him as the full command of the notes of the musical scale are to the singer. A distinct articulation is sometimes more than equivalent to mere strength of lungs; a speaker so gifted, may, though possessing but a feeble voice, be

distinctly heard in remote parts of the room, while the bawling of the mere spouter may be too loud to be properly understood.

After a full command over all the elementary sounds and their possible combinations has been obtained, it is an excellent practice, well calculated to strengthen the vocal and articulating organs, to learn a speech or a song by heart, and to repeat them with as much rapidity as is compatible with a correct and distinct articulation of each syllable.

It has been ascertained that a fluent speaker enunciates about 120 words in a minute, or above 7,000 within an hour. Speeches have been delivered at the bar and in the senate of five or six hours duration. The speaker must, therefore, during that time, have uttered above 40,000 words, or nearly as many as are contained in Richardson's large dictionary. But as few if any orators either require, or have at ready command, more than 7,000 words, it follows that the speaker may be said to repeat his whole vocabulary every hour. Some orators, possessing an unusually rapid enunciation, have been known to utter above 10,000 words within an hour.

Those who have heard Charles Mathews in some of his parts, or Albert Smith's songs, can judge what great precipitancy of speech may be gained by practice. It is scarcely necessary to add, that rapidity of utterance is here merely recommended as a means to an end, and not as a habit to be acquired, which, in a public speaker, would be a serious fault.

But while rapid delivery should be avoided, the

speaker must not fall into the other extreme, unless he wishes to produce a soporific effect, which a slow and drawling delivery is almost certain to accomplish.

Management of the Breath.

All parties agree as to the importance of the proper management of the breath, both in singing and in speaking. The principle rules as generally given are: to fill the chest before beginning a strain; to prepare by deep inspirations for long passages; and to take the proper advantages of pauses for emitting the vitiated, and inhaling fresh air.

In order to come to a clear understanding on this important point, it is necessary to bear in mind that in a quiescent state we breathe from sixteen to twenty times a minute. This number of inspirations is diminished when the vocal and articulating organs are in activity; and during rapid delivery, the inspirations are sometimes reduced to about ten in a minute.

But as this diminution of the respiratory movements, in combination with the activity of the vocal organs, rapidly exhausts their nervous and muscular energy, it should be the first object of the speaker and singer, to acquire a complete control over his respiratory movements, so that he may be able to approximate their number as near as possible to that of the normal state.

Great as the value of deep inspiration is as a means of developing the lungs, care must be taken that these organs are not unduly filled in speaking and singing.

There are not many occasions when a long breath is actually required, and the advice given in most works to stammerers, public speakers, and singers to take deep inspirations before commencing long passages, rests on the fallacy that the power of lengthening a note or pronouncing a long sentence depends entirely on the quantity of air in the lungs; while that which really enables singers and speakers to sustain the voice is the control which they have obtained over the *expenditure* of the breath, so as to adapt the quantity to the object. The chief means to possess this power of sustaining the voice with a comparatively small amount of breath, is to acquire a power over the action of the diaphragm, as explained in a previous chapter. By resorting to diaphragmatic respiration, the superior muscles are less engaged, and the lungs act more freely. There is no doubt that the victory which Farinelli is said to have obtained in a contest with a celebrated trumpet player with regard to their powers of holding on a note, was not so much due to the respective capacities of their lungs, but to the greater command which the singer had over the action of his diaphragm.

In order to prevent the accumulation of vitiated air in the lungs, it is best that a somewhat forcible expiration should precede every inspiration during the pauses. To breathe at the proper time, and in the proper place, is an art which is indispensible to every speaker and singer. But although the general rule—to breathe whenever the sense requires a pause, is simple enough, it requires considerable practice under a skilful tutor to acquire this art—for such it really is.

CHAPTER XXI.

PUBLIC SPEAKING

AND

ORATORY.

THE old saying — "*Orator fit; poeta nascitur*," contains, like many other time-honoured adages, its due admixture of error. True it is that most men, not otherwise disqualified, may, by education and practice, become fluent and even agreeable speakers, as they may become polished and elegant versificators; but that indescribable something—that *afflatus*, which proceeding from the brain of the orator, reaches into and vibrates in the inmost recesses of the mind of the listener, is as much inborn as the poet's fancy, which "gives to airy nothing a local habitation and a name."

The opinion just expressed does not relate merely to the pure intellectual element, but to its manifestations as

modified by those constitutional peculiarities termed temperaments, by which human beings are greatly distinguished.

Individuals of a phlegmatic or of a sanguine temperament are certainly not so fit to become great orators, as those of a choleric temperament. The former lack the requisite irritability; the latter are deficient in perseverance. That which distinguishes the choleric temperament above all the others is not only the capacity of conceiving great ideas, but the power of realising them by that tenacity of purpose which disregards all apparent or real difficulty. It will, therefore, be found that the most illustrious orators have been and are, with few, if any, exceptions, men of choleric temperament.

With these reservations, oratory may be considered as both a science and an art, which can be acquired by all who are not labouring under any permanent mental or physical defect.

Moral Qualification of the Orator.

The basis of oratory is, according to Cicero, consummate wisdom, which can only be gained by a union of the very highest mental endowment; hence, he concludes that a perfect orator must be a perfect man. If this definition be accepted, it follows: that the world has not yet seen a perfect orator, and that *the* orator must be "the coming man."

Quintilian also contends that a great orator must be

a *good* man; but his notion of morality seems not to have been of the highest standard, for he thought that the means sanctified the end, and that consequently orators may, under certain circumstances, tell lies. This moral code has received the sanction of modern lawyers. "A pleader, must have no scruples about this or any other act whatever that may benefit his client;" and again—"An advocate knows but one person in the world—his client, and no other. To serve that client by all expedient means, to protect that client at all hazards and costs, is the highest of his duties. And he must not regard the alarm, the suffering, the torment, the destruction, which he may bring on others." *(License of Council.)* Hence the scenes more than once witnessed in our courts of justice, or rather of law, where advocates have vouched, with the most emphatic asseverations for the innocence of an atrocious murderer, of whose guilt they have no doubt whatever. It is, therefore, not surprising that the people, who can neither comprehend this sort of morality, nor abstract the function of the advocate from the duty of the man, have conceived a prejudice against the whole craft, and are somewhat doubtful about the existence of an *honest* lawyer, who, as is recorded of Sir Matthew Hale, would not engage in any cause which he was convinced was unjust.

But while it may be doubted whether eloquence has any necessary connection with, or is dependent on the morality of the speaker, it is certain that a bad man cannot be a consummate orator, at least, with respect

to the influence which he is able to exercise on an audience to whom his character is known.

It is no doubt true that "though the preacher be a sinner, yet his precepts may be divine:" yet it is equally true that the most heart-stirring sermon on charity, or the most eloquent and vivid oration on temperance, lose half of their effects if the respective speakers are known to us—the former as a notorious rich miser, and the latter as an inveterate drunkard; so little are we generally inclined to dissociate theory from practice.

True eloquence may therefore be defined—wisdom and truth aptly and effectively expressed—and it is in this sense only that oratory can be considered as one of the highest achievements attainable by man.

Public Addresses.

There are various modes of addressing public audiences. The first is, reading a discourse from a manuscript. This mode is best adapted for didactic and scientific expositions, which require great exactness in detail. The chief object in such discourses is to *instruct*, and not to rouse the emotions; the interest of the audience being in such cases more centred in the subject than in the exponent. All that is requisite is, that the lecturer should possess a clear enunciation, and that he should be a fair sight-reader, that is to say, he should have habituated his eyes to precede his voice, so as to take up a line or two before enunciation, which

enables him to complete a sentence without looking at the paper. In this, the reader will be greatly assisted by having the matter written in very legible characters on large sized paper, so as not to require frequent turning.

This is, however, except for purely scientific and other purposes, the least effective method of addressing public audiences, unless the lecturer be indeed a first rate reader, which is a very rare accomplishment.

The chief advantage of a written discourse is, that it is more elegant and correct in language—more methodical in arrangement—and that the time it occupies can be easily calculated.

The second mode, which is speaking from memory was generally practised by the ancient orators, and is still followed by some eminent preachers and parliamentary speakers. The whole of the subject matter being first written down, is then learned by heart, as it is termed. This course may be advantageously adopted by persons naturally gifted with a retentive memory, who entertain no dread of its failing them in the hour of need.

The great superiority of speaking, instead of reading a discourse, consists in the circumstance that the orator looks into the face of his audience, and brings them under the influence of his eye. An additional advantage which the speaker enjoys is, that from his apparent emotion, and greater freedom of action, he is believed to deliver sentiments engendered at the moment of utterance.

But besides that the mass of preachers and speakers,

neither possess so retentive a memory, nor have sufficient leisure to write and to study their discourses, this method has the drawback that it disenables the orator from changing his illustrations when the audience become fidgetty and listless; nor have all memoriter speakers the skill of concealing the art which produced the effect, which, when once perceived, greatly detracts from the effect of the oration.

A third mode consists in writing down and only committing to memory certain important parts of the discourse, and to trust for the language of the rest chiefly to the association of ideas.

This kind of speaking is the most common form employed at the bar, in the senate, in the pulpit, and in the lecture room; and is usually, though not correctly, called *extempore* speaking.

True extempore or improvised speaking is begotten by the occasion, and delivered on the spur of the moment. The off-hand orator must be able not only to express himself, but to *think* under the most exciting circumstances, as the utterance immediate follows the cogitation. A speaker so gifted exhibits, in the senate, his talent to great advantage in the *reply*. Considering that even ordinary speakers, when their feelings are unexpectedly outraged, express themselves frequently with an energy and fluency to which they are strangers in calmer moments, it is not astonishing that the practised orator, who brings to the emergency a brain well stocked with ideas and strange conceits, and who possesses a full command of language, should, on such occasions break out in all his strength, and produce a

much more powerful impression by his *reply* than by the studied and elaborate composition with which he introduced his measure. "Hansard" is filled with such incidents, which exhibit the real *extempore* speaker.

The rarity of extemporaneous talent is nowhere rendered more evident than in the two Houses of Parliament. The apparently fluent harangues which appear in the papers are, with few exceptions, not such as they issued from the mouths of honourable and noble members. Had they not passed through the sifter of the reporters, who carefully manage to separate the chaff from the grain, they would mostly appear as a crude conglomeration of broken sentences and disjointed phrases.

Composition of a Discourse.

As writing gives permanence to thought, it is very desirable that the young orator should, in the first instance, commit his thoughts to paper. In doing so, he ought neither to be thinking of rules, beauty, elegance of language, or style, but write down what is uppermost in his mind.

The habit of hesitating and mentally revolving every sentence causes not only a great waste of time, but also the frequent loss of the best ideas, which, owing to a changed current of thought, may not recur again. The mind must, therefore, at the outset, be left perfectly unfettered, if the composition is in any way to be the reflex of the writer's individuality. This habit of writing

currente calamo, in the closet, frequently engenders fluency of expression in public.

After completing the rough sketch, the writer may, on revision, apply the pruning knife, eliminating all that is superfluous, vulgar, and not pertinent; rendering clear all that is hazy, and giving vigour to what is feeble. It is of considerable moment, and requires great tact, to put the most effective passages in their appropriate places. Still more requisite is it to give to the parts composing the discourse the proper length, that the beginning or exordium, and the conclusion or peroration, should bear a fit proportion to the body, or development.

The Exordium.

It is certainly very desirable that the speaker should, at the outset, endeavour to prepossess the audience in his favour, in accordance with our old proverb—"Well begun is half done." Some writers recommend the speaker to strike home at once, and to rouse the attention of the hearers by some spirited anecdote or some terse phrase. Thus, O'Connell commenced one of his speeches—"I am a missionary, come to preach down the House of Lords." Roebuck, at the last Cutlers' Dinner, began—"Not talk politics? It is my business to talk politics." Such *exordia ex abrupto*, as they are called, may be very effective when addressing a crowd,

or in post-prandial orations, but are less adapted to intellectual and polished audiences.

Generally speaking, it may be sufficient, after some insinuating, but not fulsome opening remarks, to lay down in the exordium the main ideas which are to be developed in the discourse. A little hesitation and apparent nervousness may not be out of place in the beginning; the audience, attributing the emotion of the speaker to the influence of their majestic presence, are generally more pleased at it than at the exhibition of overweening confidence and self-sufficiency.

The Peroration.

But desirable as it may be that the audience should be captivated at the outset by a spirited exordium, it is still of greater moment that the peroration should be sufficiently effective to leave a favourable impression. While the exordium has for its object, like a bill of fare, to afford to the auditors a hasty glance at the main subjects which are to be discussed, the chief end of the peroration is clearly to recapitulate the most important points elucidated in the discourse, so that they may leave a lasting impression on the minds of the hearers. Hence the style must be more nervous, striking, and forcible than in any other part of the oration. As "All's well that ends well," so will a powerful and energetic conclusion cover, like Charity, a multitude of sins of omission and commission perpetrated in the oration.

The speaker should be careful neither to introduce nor to follow out in the peroration any new thought which may cross his mind, lest he become involved in a maze from which he may vainly try to escape.

A speaker who hesitates, or even breaks down in the middle of his discourse, generally meets with sympathy from the auditors; but every man's hand is against that oratorical *bore*, who always seems to conclude, and yet never finishes. Nevertheless, the man rather deserves our pity than our wrath. Surely the wearied audience is not more anxious of being relieved from the disagreeable sensation of being, as Carlyle says, "like buckets pumped into for an unreasonable time," than is the speaker to be released from his uncomfortable position. It can be easily observed that he makes desperate but vain efforts to detach his hand from the pump to which it seems magically glued. On he works, until at length the audience, being brimful to overflow, drown, by way of retaliation, the speaker's voice by vociferous cries of time, and thus bring his oration to an untimely, or rather a timely end.

Let, then, every novice be perfectly at home in his peroration, were it only that it enables him to sit down, which is an art in itself.

Learning a Discourse by Heart.

The most effective way of committing an oration to memory is to follow the old rule: *Scire si vis rem, tota sit separata minutim.*

Divide the subject into small parts, and never attempt to proceed to the following part until you have completely mastered the one preceding it. Much will depend upon a skilful arrangement of the divisions and sub-divisions, so that they should be suggestive of what is to follow.

The best time for charging the memory is to do so the last thing at night, (provided no heavy supper has been taken) and to call it to account the first thing in the morning. The advantage of this method is that no intervening waking thoughts impair the last impressions. The contrary is the case if, as is usually recommended, the morning hours be devoted to learning lessons by heart. The early part of the day is the best time for meditating upon and fixing upon the memory the ideas imbibed on the preceding day.

It is advisable that an hour or two before delivering his discourse, the orator should take a mental survey of the principal parts of his speech.

Breaking down.

Every speaker feels now and then, from some unexpected idea crossing his mind, that he is about losing the thread of his discourse. The practised orator is prepared for such contingencies. He either calls the rarely failing expedient of tautology (see style) to his aid; or he follows out the fresh idea, and incorporates it in his discourse, until he sees his path clear before him. An inexperienced speaker, on the contrary, be-

comes distracted by the slightest incidents, such as persons coughing, or leaving the room, and frequently breaks down.

Aspirants to oratory should, however, not be discouraged at failing at first; as most orators, from Demosthenes down to the present time, have done so. The first appearance of Sheridan in Parliament was such a complete *fiasco*, that his friends dissuaded him from making another attempt; but Sheridan replied—"I *will*—for by Heaven it is *in* me, and it shall come out;" and out it came with a vengeance.

The shouts of laughter with which Mr. Disraeli's maiden-speech was received by an assembly generally indulgent to first attempts, did not crush the aspirant for power. He, like Sheridan, felt that there was something in him, and he merely uttered a prophecy, since fulfilled—"The time will come when you shall listen to me."

In a memoir of the life of the celebrated preacher, Robert Hall, by Dr. Gregory, it is stated that when a student at Bristol, he had to preach in his turn at Broadmead Chapel. After proceeding for a short time, he suddenly stopped, covered his face, and exclaimed—"I have lost all my ideas," and sat down. The second attempt was a failure more painful to witness. Hall tried again, and we know with what success.

Influence of the Audience upon the Orator.

There are many persons, who, though perfectly able to express themselves with great propriety and con-

siderable fluency in a private circle, become nearly paralysed when brought before a large audience, and have to resort to spirituous liquors to acquire the requisite courage. There can be no objection to a glass or two of wine to counteract the nervousness of a young speaker; the real danger lies in its becoming a habit to draw courage from the bottle, and in its weakening that confidence in his own powers, upon which the success of the orator greatly depends. An orator who has not accustomed himself to draw nerve-force and sprightly ideas from the "pocket pistol," will rarely require any such stimulants.

Although much depends upon constitutional peculiarities, it is neither advisable to speak on an empty nor an overloaded stomach. Four hours after a moderate meal may be considered the most proper time, as the chyle is then being coverted into blood, and imparts new strength to the speaker.

As every room has its peculiarities, the speaker will be much benefited by becoming, if possible, acquainted with them. Orators have been recommended to address, if the hall be very large, their discourse to the persons most distant, in order to become audible to all. This mode does not generally answer the purpose, and is besides attended by the great disadvantage of forcing the speaker unduly to strain his voice. The best plan is, in such cases, to speak to the centre of the audience, and to commence with the middle key, as there are but few speakers who have acquired sufficient strength and distinctness in the low notes of their voices to

become audible in a large space when commencing in a low key (*Compare Speech-voice, page* 360).

As a moral means to overcome the dread of an audience, orators have been advised to imagine that they only see before them a vast number of heads of cabbages. Luther, who must have experienced a similar emotion, says—"When a man first comes into the pulpit, he is much perplexed to see so many heads before him. When I stand there, I look upon none, but imagine they are *all blocks* that are before me."

It is, however, an error to look at an audience as a mere collection of individuals, for no sooner have they experienced the first effects of the discourse than they amalgamate and become, for a time, *one* huge body, possessing apparently but *one* consciousness, and exhibiting the same physical and mental phenomena.

The chief cause undoubtedly is that magnetic sympathy which links together all human beings, and makes them, for the moment, common partakers in the same emotions, and thus makes the whole audience as it were one intellectual organism. Hence the speaker, though he may consider himself in knowledge and rank superior to any individual present, soon feels that when amalgamated, he faces a giant, compared to which he is a pigmy. Thus the sovereign, though greater than any individual subject, is subordinate to the people in the aggregate.

But while a crowd may well inspire a speaker with some kind of awe, it is certain that the greatest orato-

* *Table Talk*, translated by W. Hazlitt. Bohn.

rical effects can only be produced when the audience is sufficiently large. The very same sentiment, enunciated by the self-same speaker in the same manner, which may be a *brutem fulmen* in a small assembly, may produce thunders of applause in a large one. The reason is that in a crowd every impression is, owiug to the instinct of imitation, multiplied and rapidly propagated. Thus a hearer, when he listens alone to most exquisite song or discourse, may feel, and not betray any violent emotion: but in a crowd he is caught and carried away by the rest. The exhibition of these emotions of the multitude re-acts on the speaker, and actually supplies him with additional force. A sympathy is thereby established between the audience and the observant orator—he deciphers their feelings by their looks, and adapting his language to their feelings, his diction becomes more confident and bolder; and new and effective thoughts present themselves for utterance.

Very small audiences, in large rooms, must, therefore, not expect oratorical displays from an extempore speaker, who feels a secret disdain of exhibiting his power before so few listeners, and whose presence afford him no new force.

Action.

It is an ultimate fact that external expression, unless purposely repressed, generally corresponds with internal emotion. In order, therefore, that artificial or oral language should produce its full effect, it is requisite

that its natural concomitants, action and gestures, should harmonize with the spoken word.

"To be on the legs," is, in parliamentary language, used as a synonym for speaking: but it is not generally known that in order to *speak* well, the orator must be able to *stand* well—that is to assume an attitude which gives him entire controul over all the organs of his body. A stooping or awkward posture, besides being ungainly, interferes with the healthy action of the vocal and respiratory apparatus, and soon exhausts the speaker. The general rule given is to stand in an erect (not haughty) position, on one limb, the foot firmly planted on the ground, while the other limb, a little in advance, the toes pointing outward, is slightly bent, and at rest. This may be the more graceful attitude for the platform orator; speakers, however, who, like clergymen, are confined to a small space, and whose lower limbs are concealed from view, will be less fatigued at the end of the sermon if they have accustomed themselves to stand firmly on two feet, instead of seeking relief by turning one leg around the other.

As the chief part of bodily action consists in the proper use of the hands, the ancients attached the greatest value to their language.

"Have not," says Quintilian, "our hands the power of exciting, of restraining, of beseeching, of testifying approbation, admiration, and shame? Do they not, in pointing out places and persons, discharge the duty of adverbs and pronouns? So that amidst the great diversity of tongues pervading all nations and peoples, the language of the hands appears to be a language common to all men."*

* *Quintilian's Institutes of Oratory*, by J. S. Watson. Bohn

There exists some difference of opinion as to the exact time when action should commence.

Quintilian held, that the external movements should exactly commence and terminate with the sense; in order that the fierce looks and other gestures might neither be in advance nor lag behind the emotion and the sense. This rule is, however, not in accordance with the natural law; for though the gesture may be concurrent with the thought, it must precede its audible expression. Thus, the frown is in the natural order, always in advance of the spoken remonstrance. Unless, therefore, the external expression commences somewhat before the spoken word, the orator runs the danger of being suspected that he merely acts his part, and that he is not prompted by any real emotion.

Archbishop Whateley, who disapproves of action generally, remarks, (*Elements of Rhetoric*), that the habit of keeping the body still, is, perhaps, the more rational and dignified way of speaking; admitting in the same sentence, that "So strong is the tendency to indicate vehement internal emotion by some kind of action of outward gesture, that those who do not encourage or allow themselves in any, frequently fall unconsciously into some awkward trick of swinging the body, folding a paper, twisting a string, or the like."* Yet his Grace

* I remember when I was a young man, and used to frequent Westminster Hall, there was a counsellor, who never pleaded without a piece of packthread in his hand, which he used to twist about the thumb or a finger all the while he was speaking; the wags of those days, used to call it "the thread of his discourse," for he was not able to utter a word without it. One of his clients, who was more merry than wise, stole it from him one day in the midst of his pleading; but he had better left it alone, for he lost his cause by this jest. (Letter in the *Spectator*, June 17, 1712.)

still maintains that "no *care* should, in any case, be taken to use graceful or appropriate action; which, if not perfectly unstudied, will always be intolerable. But if any one falls into any gestures that are unbecoming, care should *then* be taken to break the habit." The italics, it may be observed, are in the original.

It seems certainly surprising that so profound a thinker should not have taken into consideration the great difficulty of breaking *any inveterate* habits, and especially those of bodily motion, which baffle the most strenuous efforts of both teacher and pupil. Prevention in such cases is better than cure; nor does the study of *appropriate* action, necessarily imply *studied* action.

Many speakers, no doubt, offend by the vehemence and profusion of their gesticulation, when there is little occasion for it. A French writer has justly observed, "Il faut remuer les bras parsqu'on est animé; mais il ne faudrait pas, pour paraitre animé, remuer les bras." We should move the arms, *because* we are animated, but not try to appear animated by moving the arms.

As in most cases, the middle road is the safest; it may, for the purpose of public speaking, be sufficient to study under a skilful teacher the most becoming mode of performing the natural motions.

To dispense with action altogether, and thus to repress the outward signs of internal emotion is as *unnatural*, as it may be, on the other hand, *undignified*, to express the feelings by studied and theatrical attitudes. The chief end of this kind of instruction ought to be to prevent the contraction of ungraceful and ex-

travagant bodily motions by the formation of a habit of controling external expression, and so to render it chaste and natural.

The advice given to speakers to practise before a looking glass, has this drawback, that few are good judges of the graces of motion, and that the great majority of mankind are so much in love with themselves, that they are very apt to consider their very defects as so many beauties. The opinion of a judicious and *truthful* friend is more to be relied upon than the reflection of the glass.

With regard to particular rules concerning action and gestures, modern writers have done little more than to amplify those given by Quintilian, and which may be still consulted with advantage by every public speaker.

Elocution.

While gestures, looks, and bodily motions convey part of our sentiments to the eye, elocution carries them to the ear. Action and elocution form thus the constituent parts of *delivery*, which, in an extended sense includes everything connected with speech.

To establish a standard of perfect delivery may be difficult; but no delivery can be called good, which is not at least free from actual defects and vulgar peculiarities of pronunciation, and which does not by a graceful management of the voice and gestures, convey to the mind of the hearer the sentiments

of the speaker in a distinct and pleasant manner. Its paramount importance to the orator being admitted, the question arises whether a good elocution is a natural gift, or whether it be an art which, as such, must be studied.

Oral or written language is not always capable of expressing those nicer and deeper shades of feeling, which gestures and tones so forcibly convey; nay, the tone in which an expression is uttered may entirely change the idea embodied in the spoken word. In illustration of which may be quoted the following passage in "Kenilworth," by Sir Walter Scott. Elizabeth, anxious for the reconciliation of Sussex and Leicester, addresses them thus:

"Let me see you join hands, my lords," said Elizabeth, "and forget your idle animosities."

The rivals looked at each other with reluctant eyes, each unwilling to make the first advances to execute the queen's will.

"Sussex," said Elizabeth, "I entreat—Leicester, I command you."

"Yet so were her words accented (modulated?) that the entreaty sounded like command, and the command like entreaty."

The inflection or modulation of the voice—that is its transit upwards and downwards in the scale, according to the variation of thought and feeling, becomes thus the interpreter of the word, and carrying its apparent or hidden meaning both to the intellect and the heart of the listener, is one of the most important adjuvants of oratory.

The unpractised reader or speaker betrays his inexperience immediately, either by the utter absence of inflection, which invariably produces a disagreeable monotony, destroying all variety of expression, or by over doing it.

Some authors insist that in declamation, the voice should be kept between *do* and *sol* of the scale; that *do* should be used for explanation; *re* in elevating the vowels; *mi* for the gentler passions; *fa* for emphatic passages; and *sol* for the most pathetic parts. The student may find a scientific arrangement of the various forms of inflections in Dr. Rush's able work on the voice.

Earnestness.

It has already been noticed, that an oration may fail in its effect if the audience doubts the sincerity of the speaker. This sincerity or earnestness may either relate to the convictions of the orator, or to the mode in which he expresses his sentiments. In order to produce the desired effect it is by no means sufficient for a speaker to *be* in earnest, it is absolutely requisite that he *shows* it by the mode of his delivery, so as to leave no doubt in the minds of his audience, that he actually feels what he utters.

In Shakespear's *Richard II*, the Duchess of York thus upbraids the insincerity of her husband.—

"Pleads he in earnest! look upon his face;
His eyes do drop no tears; his prayers are jest;
His words come from his mouth; ours from our breast."

"He prays but faintly, and would be denied;
We pray heart and soul."

There is an often quoted anecdote, related of Betterton, who, on being asked by a prelate, "How it came to pass that people are so moved at a play which they know to be fictitious; while they listen with apathy to the most sublime truth enunciated from the pulpit?" The answer was, "Because you deliver truth as if it were a fiction—we deliver fiction like truth."

Dr. Whateley objects, also, to studied elocution; and though he admits that the effects of the most perfect composition may be entirely spoilt by a bad delivery, another, inferior both in matter and style may produce, if better spoken, more powerful effects; he contends that probably not a single instance could be found of any one who has attained, by the study of any system of instruction that has hitherto appeared a really good delivery; but that probably as many as have tried the experiment have, by this means, been totally spoilt, and have fallen irrecoverably into an affected style of spouting, worse in all respects than their original mode of delivery.

There are probably very few of those who have read the biographies of the illustrious orators of ancient and modern times, many of whom have successfully toiled to obtain an effectual delivery by long and systematic study, who would feel inclined to acquiesce in the archbishop's sweeping denunciation of all artificial systems of elocution.

True, a man may have an excellent delivery without

knowing anything of the principles of rhetoric, just as a man of sense may reason well without the least knowledge of the elements of logic; but can it be contended that by studying Dr. Whateley's excellent treatises on logic, the latter may not be greatly improved in his *modes* of reasoning? And if his reasoning be radically defective, will he not be still more benefited by their perusal? Granting that all systems of elocution hitherto published are defective, still they contain, more or less, the accumulated results of experience; and it may perhaps not be going too far to say that *any* system is better than *no system at all.*

The principle which his Grace considers radically erroneous, and which vitiates every system founded in it is, that in order to acquire a perfect delivery it is necessary to fix the attention on the voice;—to study analytically the emphases, tones, &c.—to frame rules founded on the observation of these—and then in practice, carefully and deliberately to conform to the utterance of these rules. And as whoever applies in practice any artificial rules of eloquence, hardly ever fails to betray his intention, which always gives offence when perceived, Dr. Whateley protests against all *direct* attention to delivery *at the time.*

If artificial elocution can really be shown necessarily to produce the effect of withdrawing the attention of the speaker from the matter to his manner, it would certainly be liable to censure. But is it so? Do not the words and sentences, arranged according to numerous rules of grammar, present themselves to the mind of an extempore speaker, without his directing his

attention to them at the time? And may it not become as natural to him to speak gracefully as well as grammatically, without betraying any apparent attention to the principles of elocution, by which he is guided?

To speak gracefully is as much a habit, as to speak grammatically; and if the habit is formed in early life, it becomes a second nature.

The archbishop's protest against all artificial elocution may perhaps be explained by the following sentence (*Rhetoric*, p. 340):—"Novelty affords, at least, an opening for hope; and the only opening when former attempts have met with total failure."

After all, there is not so much novelty in the natural system. Quintilian remarks on this point in his *Chapter on Delivery*—"There are some who think that an unstudied mode of delivery, such as the impulse of the speaker's mind produces, is more forcible, and indeed the only mode of delivery worthy of men. But those who hold this opinion are mostly such as make it their practice to decry all care, art and polish in speaking in general, and to condemn whatever is acquired by study as affected and unnatural. Let those, however, who think it enough for men to be born to become orators enjoy their own opinion, but let them be indulgent, at the same time, to the trouble which I take, who believe there can be no consummate excellence except when nature is assisted by art."

Style.

Considered as an art, public speaking may be said to consist in the skill so to model our discourse that it may produce the desired effect upon other minds.

The ends proposed may be—

1. To entertain an audience by pleasing the imagination.

2. To enlighten their intellect, and so to influence their opinions.

3. To appeal to their emotions and passions, and to rouse them to action.

The relative excellence of a discourse depends, therefore, mainly on its adaptation to the end proposed.

Merely to please a mixed audience, especially if it be a large one, may require some talent, but scarcely any degree of eloquence. A picturesque or somewhat extravagant style — a tolerable delivery—a fund of sprightly anecdotes to illustrate the subject—rarely fail to answer the purpose. The success of a host of entertainers who have lately sprung up proves how little is required to please the multitude.

A speaker who addresses himself exclusively to the intellect of his hearers, and who has interesting facts, which cannot be gainsaid, to communicate, is, to a great extent, independent of the graces of eloquence, as the manner of the speaker is oppressed by the interest attached to the facts. Perspicuity, a good arrangement of the matter, and a fair delivery, free, at least, from

actual blemishes, are all that is requisite for didactic purposes of this kind.

The case is, however, materially altered if the subject of the discourse, whether scientific, political, or theological is a debatable one; the style then acquires importance. The speaker must not only have his arguments well arranged, but must try to carry conviction to the minds of his hearers by first removing their prejudice against the opinions which he wishes to establish.

To effect this, requires a considerable amount of oratorical powers, especially if the subject be somewhat vague; in such cases the manner transcends the matter, as the interest attaches more to the speaker than to the subject.

The greatest *display* of eloquence may perhaps be requisite when the chief object of the speaker is to rouse his hearers to action by appealing to their emotions and passions.

The ancients seem to have distinguished three different styles of oratory, viz.: the Attic, or Laconic, the Rhodian, and the Asiatic. The Attic style was characterised by its conciseness and energy, while the Asiatic was florid, showy, and prolix. The Rhodian style, formed by Aeschines during his exile at Rhodes, held an intermediate rank between the Attic and Asiatic, being neither so compressed as the former, nor so inflated and showy as the latter.

The essential qualities of a good style are: *animation*, *energy*, *elegance*, and *perspicuity;* the chief faults

in style are in its being *cold*, *prolix*, *bombastic*, or *obscure*.*

Orationis summa virtus est perspicuitas, (the chief excellency of oratory is perspicuity) says Quintilian, with great justice; since a speaker who is not intelligible speaks to no purpose. But if perspicuity is defined as that quality of a discourse which readily presents to the minds of the hearers the ideas of the speaker, it is clear that it cannot be a quality inherent merely in the discourse; but that a portion of its perspicuity must be derived from and be dependent on the mind of the listener. Just as a pair of spectacles, though perfectly transparent, will not suit every sight, so may a discourse appear perfectly clear to one audience and obscure to another. It is, therefore, requisite that the degree of perspicuity should be skilfully adapted to the mental vision of the audience in the same manner as the optician adapts the focal distance of his glasses to the peculiar structure of the eye of his short or long-sighted customers. A highly intellectual audience may actually feel insulted if the orator or lecturer appears anxious over-much to render his subject clear, thereby indicating but small confidence in their perceptive powers. A speaker, who addresses certain audiences, at stated times, can have no difficulty in selecting the style suited to them; for he ought to know whether (if the expression be permitted) he has a mentally myopic or presbyopic assembly before him.

* *See* Dr. Blair's *Lectures on Rhetoric*, and Dr. G. Campbell's *Philosophy of Rhetoric*.

The orator, on the other hand, who has to address a large and mixed audience on subjects not usually within their range, has a more difficult task to perform. On such occasions, whether it be from the platform or from a pulpit, a condensed style is out of place. A dilution of the truth then becomes a necessity, and tautology, as distinguished from pleonasm and verbosity* becomes a virtue. The speaker must reiterate his meaning in a variety of ways if he would act on the popular mind, that is to say, he must shift his lanthorn in every direction, and bring the light to bear upon every side of the subject. It is scarcely necessary to add that an inverted construction and long sentences are impediments to perspicuity in public addresses, though they may not be so in written discourses, when the reader has an opportunity of reading the passage over and reflecting on it.

While perspicuity renders the discourse clear to the understanding of the listener, the object of animation in in the speaker is to rouse the attention; that of perspicuity forcibly to impress upon the mind the chief points of the subject matter; and elegance or beauty of expression is mainly adapted to please the imagination of the hearers. Elegance of style and energy are rarely combined in the same orator, as the former, according to certain refined notions, requires the elimination, not

* Tautology consists in a repetition of the meaning with a variation of words; pleonasm means a superfluity of words in the same sentence, which have all the same meaning; verbosity implies that though many words and sentences may have a different meaning, they are not important, and rather weaken than enliven the expression. (See Dr. G. Campbell's *Philosophy of Rhetoric.*)

merely of absolutely coarse, but of the most homely Saxon expressions. The popular orator cannot serve these two masters—if he would be forcible, he cannot at the same time be strikingly elegant.

Greek and Roman Orators.

The two greatest orators of Greece, Aeschines and Demosthenes, flourished about 350 B.C. As they stood at the head of the two parties into which Athens was then divided, they were constantly in opposition, and hated each other with corresponding cordiality.

Aeschines was by nature gifted with a good voice, and having been an actor and a scribe before he set up as an orator, enjoyed an important advantage over his great antagonist, Demosthenes. There are but three of his orations extant, which have been compared to the three graces, and nine of his letters to the muses. Aeschines excelled so much in off hand or improvised speaking that he was considered as the inventor of extempore oratory.

What perseverance can accomplish is demonstrated by the career of Demosthenes, who had, at the outset, to contend with natural deficiencies, which would have precluded most persons from attempting to shine as public orators. It is probable that the careful preparation which, owing to his neglected education, he required for any oratorical essay, rendered it in the end difficult or impossible for him to speak extemporaneously; at least, he never ventured to do so, and to

trust to the impulse of the moment. Hence, his orations exhibit the strictest method, and the best arrangement, so that every part is in its proper place.

The orations of Demosthenes have been edited, and many times re-edited, and most of them have also been translated into English.

Hortensius (Quintus) and his great rival, Cicero, (Marcus Tullius) are considered as the most celebrated orators of Rome.

The orations of Hortensius not having been preserved, an opinion of his eloquence can only be formed from the statements of the ancients. Cicero pronounced a high eulogium on the genius of Hortensius in his celebrated treatise, entitled *Brutus*. Quintilian is, however, of opinion that the perusal of the orations of Hortensius scarcely justified the fame which he has acquired in speaking them.

The great excellence of Cicero as an orator, resulted from the comprehensive grasp which he possessed over all the resources of his own language. His diction was sufficiently florid to be attractive, yet far from being so gaudy as the Asiatic style of Hortensius. The chief defect in his orations, is too much amplification or diffuseness, and an evident and rather ostentatious straining after effect.

Cicero prepared his orations; but that he must have been able to speak extemporaneously with good effect was amply proved on an emergency.

When Roscius Otho carried a law by which places in the theatre, immediately behind the senators, were set apart for the equestrian order, the people became

greatly excited, and a dangerous riot seemed unavoidable, when Cicero entered, and having induced the people to follow him to the area of a temple in the vicinity, addressed them with such an effect that they returned and paid their respects to Otho, whom they had just greeted with the loudest expressions of disapprobation.

Of the numerous works which have been handed down to us, none is more important in relation to the art of speaking than Cicero's three books, *de Oratore*, and the treatise, *de Claris Oratoribus*, already mentioned under the title, *Brutus*, which contains masterly sketches of the most famous orators of Greece and Rome down to his own time. Cicero and Hortensius flourished about 50 B.C.

Celebrated British Orators.

Eloquence is a seed which can neither germinate nor take root in a despotic soil. We know little or nothing of the eloquence of most nations of antiquity, such as the Egyptians, Assyrians, Persians, and Medes. But when Greece and Rome became free, the pent up eloquence of ages suddenly burst forth, fully armed like Minerva from the front of Jupiter. It is then only in representative and democratic governments, where freedom of expression is the birthright of every citizen, and where the last appeal lies to the body of the people, that eloquence can grow up a stately plant.

Hence Greece, Rome, and Great Britain have given birth to the greatest orators the world has ever seen.

The following condensed notices of a few of the most illustrious of our own orators are less intended to adorn a tale than to point a moral.

William Pitt, Earl of Chatham, (born 1708 died 1778,) had certainly most of the personal qualifications of an orator. His voice was full and clear, his articulation so distinct that his lowest whispers were heard; while when he elevated his voice the house was completely filled with the volume of sound. His attitudes were energetic, yet dignified and graceful. Such, says one of his biographers, was the power of his eye, that he very often cowed down an antagonist in the midst of his speech, and threw him into confusion. His delivery was majestic and forcible; and he had spirit-stirring notes, which were perfectly irresistible. Chatham especially excelled as an extemporaneous speaker; most of the passages which started the house arose out of some incident. This power of extemporising, so essential to a senator, and especially to a minister, was the reward of the severe course of training which Chatham underwent whilst at Oxford. For the purpose of acquiring a thorough command of language, he is said to have gone twice through the folio edition of Bailey—the best before Johnson. Chatham had, moreover, sufficient tact, when he entered parliament at the age of twenty-six, to remain silent for nearly a year, during which he carefully studied the character of the house.

William Pitt, Chatham's distinguished son (born 1759 died 1806), submitted to an equal amount of drudgery

to become an orator. Some biographers assert that in his early childhood his father made him stand upon a chair and recite. Pitt's oratory is described as wanting the earnestness and imagination of his father, but as highly imposing and effective from the energy of his intellect, his power of sarcasm, and his dignified and sonorous enunciation. A report of his first speech, in support of Burke's bill, on the regulation of the civil list, says, "His voice is rich and striking, full of melody and force; his manner easy and elegant; his language beautiful and luxuriant. He gave in his first essay a specimen of eloquence not unworthy the son of his immortal parent."

In striking contrast to the stately, dignified, and flowing eloquence of Lord Chatham and William Pitt, stands the artless, blunt, but vigorous oratory of Charles James Fox, (born 1749 died 1806). Broad shouldered, thick set, with a voice of small compass, Fox felt that any attempts at studied attitudes, or graceful elocution would only render him ridiculous. He therefore depised these important adjuvants. Yet such was the power inherent in his style, that his very defects, such as his ungainly gestures, and his screams, became, from their evincing the most perfect earnestness and sincerity, highly effective. His first sentences came out hesitatingly, and at intervals, like the intermittent squalls before the approaching storm; but when he got warmed he broke out like a hurricane. "He forgot himself," says Sir James Mackintosh, "and everything around him; he darted fire into his audience; torrents of impetuous and irresistible eloquence swept along their feelings

and convictions." Fox was an extempore speaker, and careless about style; to him is attributed the saying, that a speech which reads well must needs have been a bad speech, which certainly is a *non sequitur*.

There is, however, ample evidence that however much Fox may have trusted to the impulse of the moment, the arrangement of his matter, and the argumentative part of his discourse, were the result of ample premeditation. Fox is also distinguished from many of his contemporaries in his predilection for Saxon terms: "Give me," said he, "an elegant Latin and a homely Saxon word, and I will always choose the latter." Hence the rough bluntness of his phraseology. Nor must it be omitted, that Fox attributed his success as a debater to the resolution he had formed, when very young, of speaking well or ill, at least once every night. "During five sessions," he used to say, "I spoke every night but one; and I regret that I did not speak on that night too."

If the excellence of oratory is, as some maintain, to be judged by its effects on a given audience, at a given time, and if the axiom of Fox, that a speech which is well reported must have been an indifferent speech be true, then Edmund Burke (born 1730 died 1797) was no orator at all; for the house pronounced him a decided bore. Nevertheless, he is, by competent judges, considered as the greatest oratorical genius of his time. His preserved speeches afford the most ample evidence, not only of his innate power, of his varied knowledge, and of his vast research, of the grandeur of his imagination, but also of his constant

endeavours to improve his original gifts, as is abundantly proved by the finished polish of his sentences.

The failure of Burke's eloquence with regard to its effects upon the audience, furnishes a striking illustration of the correctness of the hacknied saying of Demosthenes, that the chief excellency of oratory consisted in action, in which he included delivery. Burke was, according to all accounts, not only utterly deficient in grace of action, but so frigid in his delivery that the most nervous thoughts lost all their energy during utterance. His voice, moreover, naturally harsh, became hoarse under any exitement, and produced a very disagreeable effect. In addition to this it must be observed, that Burke was not in possession of a quality which, singular to say, is so rarely insisted upon, and yet which is most essential to success in the art of public speaking, namely, *tact;* which consists first, in selecting a subject in which the audience feel interested; and secondly, in adapting the style to their capacities or humour. The House of Commons is perhaps the last place in which an ostentatiously didactic style, such as Burke's, would be long endured; no wonder then that he was nicknamed "the dinner bell."

The last of what may be termed the quintessence of British orators of the golden era of parliamentary eloquence, is Richard Brinsley Butler Sheridan, (born 1751, died 1816.)

"It may be consoling to parents," says his biographer,* "who are in the first crisis of impatience at the

* *Memoirs of the Life of Richard Brinsley Sheridan.* By Thomas Moore, 1826.

sort of hopeless stupidity which some children exhibit, to know that in the year 1759, he was by common consent, both by parent and preceptor, pronounced to be a most impenetrable dunce."

It is well known that Sir Isaac Newton and Sir W. Scott were, by their tutors, held in a somewhat similar estimation.

Be this as it may, certain it is that Sheridan was at no time overstocked with real knowledge. He is known to have said to his friends, when urged to speak on some question—"You know I am an ignoramus, but I'll do my best." Thus he applied himself for three weeks to the study of arithmetic, in the hope of being appointed Chancellor of the Exchequer.

This outpouring of knowledge, newly acquired, is, by his biographer, rather considered as an advantage from the freshness and vivacity which is in contrast with the manifestation of that knowledge retained in the memory. The sagacity of this remark was amply confirmed by the singular freshness which pervaded the first financial budget of our present Chancellor of the Exchequer, corroborating Oxenstiern's encouraging reply when his son hesitated to accept an appointment —"Thou knowest not, my son, how little knowledge is required to govern the world."

From his want of solid acquirements, Sheridan never spoke without due preparation. Even his witty replies which set the house in a roar, were not conceived *on*, nor begotten *by*, but kept in readiness *for* the occasion. Pitt, therefore, guessed at the truth, when in replying, he spoke of "his hoarded repartees and matured jests,"

for they were found registered in Sheridan's common-place book, like the eggs of insects in different stages of development. The following parliamentary incident is interesting in more than one point of view.

"Lord Belgrave having clenched a speech in the House of Commons with a long Greek quotation, Sheridan, in reply, admitted the force of the quotation, so far as it went; 'but,' said he, 'had the noble lord proceeded a little further, and completed the passage, he would have seen that it applied the other way.' Sheridan then spouted something, *ore rotundo*, which had all the *ais*, *ous*, *kos*, and *kais*, that give the world assurance of a Greek quotation; upon which Lord Belgrave very promptly and handsomely complimented the honourable member on his readiness of recollection, and frankly admitted that he had overlooked it at the moment when he gave his quotation. On the breaking up of the house, Fox, who piqued himself on having some Greek, went up to Sheridan, and asked him—'Sheridan, how came you to be so ready with that passage? It is certainly as you say, but I was not aware of it before you quoted it.' It is unnecessary to say that there was no Greek at all in Sheridan's quotation."*

All that can be said with regard to this spicy anecdote, is, *se non e vero, e ben trovato;* if not true, it is well conceived; and if true, it gives but a sorry idea of the classical lore of the house, in the classical age of British oratory.

Sheridan's greatest triumph was his first speech on

* Extracted from an admirable article in the *Westminster Review*, vol. 4.

the Begum, in the impeachment of Warren Hastings. Pitt himself said that an abler speech was perhaps never delivered, and the effect which it produced was such, that it was deemed prudent to adjourn, to give the house time to recover its calmness.*

Much of Sheridan's strength consisted, undoubtedly, in his fascinating manner, and in his tact. His countenance, when he was in his prime, is described as having been peculiarly pleasing; added to which, he was in possession of a mellifluous voice—nor did he ever abuse the patience of the house, like Burke.

Genius creates; talent applies. Taken in this sense, Sheridan was not a genius, but he was undoubtedly a man of consummate talent. Not unlike the rough and dull diamond which leaves the hand of the skilful artist a brilliant gem, so did the crude thoughts which Sheridan seized upon, issue from his mental laboratory in such a refined and sparkling state, that they had all the appearance of original conception.

Thomas Lord Erskine, (born 1748 died 1812), whose early education had been somewhat neglected, entered, like our present Lord Chancellor, the navy, as midshipman. Though never neglecting his professional duties, he frequently contrived to escape from his companions to a quiet corner of the vessel, where he amused and improved himself in reading—picking up some new volume at every port he visited.† After serving for

* No full report of the speeches on that occasion has ever been made. This want is, according to the *Athenæum*, in course of being supplied. The speeches will be printed from the *Gurney Manuscript Reports*, copies of which are extant.

† *The Lives of the Lord Chancellors*, by Lord Campbell, vol. 6.

four years in the navy, he tried his luck in the army, which he subsequently quitted. Shut up with his regiment for two years in the island of Minorca, he devoted himself, during that period, to a systematic study of some of the greatest models of English writers, such as Shakespeare, Milton, Dryden, and Pope, so that he got them nearly by heart.

"When settled again in London," says Lord Campbell, "he was in the habit of taking part in the debates of the Robin Hood, Coachmakers' Hall, and other spouting shops, which, according to the custom of the time, were attended by shoemakers, weavers, quakers, law students, and members of parliament, each person paying sixpence, and being entitled to a glass of punch, and in which there was often a display of great oratorical power."

The phenomenon of a young sailor and soldier suddenly bursting out in full blaze as an advocate is thus explained; it was not mere intuition, but the result of long continued preparation. Erskine's defence of John Stockdale, for a libel on the House of Commons, is considered both his greatest effort, and as one of the finest models of the art of addressing a jury. Fearless and zealous, the eloquence of this distinguished advocate was generally called forth in defence of some great principle, which gave additional force to his diction.

It might not be uninteresting, if space permitted, to inquire into the reasons why the bar furnishes comparatively but few great orators; and why, with some remarkable exceptions, distinguished forensic talent

rarely succeeds in parliament. It must, therefore, be sufficient to state the simple fact, that Erskine greatly disappointed the expectations of his friends as to the effect his oratory might produce in the legislative assembly.

Has British eloquence advanced, or has it declined? Are the present race of orators inferior or superior to those of bygone days? The answer is not so easy. The *laudator temporis acti*, who views past achievements through the magnifying glass of time, will not hesitate to pronounce an adverse verdict, while the more unprejudiced critic may come to the conclusion that some of our living parliamentary speakers would not suffer much by being placed in juxta-position with the most eminent orators of past generations. There can, however, be no doubt that parliamentary eloquence must eventually decline in proportion as political economy becomes in *fact* what it is yet in *name* "*social science.*" It is the vagueness in principle which calls forth oratorical talent. The principles once ascertained and rendered evident to every capacity, debate upon them becomes as useless as a discussion upon some theorems of Euclid. We have, in fact, already seen "the beginning of the end." Party spirit is being gradually extinguished; the lion lies down beside the lamb; the Radical of the past is the Tory of the present; the Conservative of to-day may be the Destructive of to-morrow, and the Reformer of the future may have nothing left to reform. Should these halcyon days ever arrive, parliamentary eloquence will be at an end; nor will the two houses be any longer a

deliberative assembly; for there will be nothing to deliberate upon; all its functions will be then confined to vote the supplies, merely, as a matter of form. But as "a consummation so devoutly to be wished," is still far distant, the study of oratory is yet too important to be neglected by the rising generation.

Pulpit Eloquence.

The main object of preaching is to excite and to direct the reluctant attention of the multitude to a sense of their mental and moral condition, in relation to the great problem of man's destiny here and hereafter; to rouse, by enlightening their minds and engaging their feelings, the dormant conscience, for the purpose of effecting their reformation.

Dr. Martin Luther's* opinion, with regard to the qualifications requisite for a good preacher, to which he adds some wholesome advice, is as follows:—

"A good preacher should have these properties and virtues: first, to teach systematically; secondly, he should have a ready wit; thirdly, he should be eloquent; fourthly, he should have a good voice; fifthly, a good memory; sixthly, he should know when to make an end; seventhly, he should make sure of his doctrine; eighthly, he should venture and engage body and blood, wealth and honour in the word; ninthly, he should suffer himself to be mocked and jeered of every one.

* *Table Talk. Loc. cit.*

"I would not have preachers torment their hearers and detain them with long and tedious preaching, for the delight of hearing vanishes therewith, and the preachers but hurt themselves.

"We ought to direct ourselves in preaching according to the condition of the hearers; but most preachers commonly fail therein; they preach that which little edifies the poor simple people. To preach plain and simply is a great art; Christ himself talks of tilling ground, of mustard seed, &c.; he used altogether homely and simple similitudes.

"I would not have preachers in their sermons use Hebrew, Greek, or foreign languages; for in the church we ought to speak as we do at home, the plain mother tongue, which every one is acquainted with."

These golden rules deserve as much to be framed by every clergyman, as Hamlet's famous advice to the players by every actor. But it is especially with regard to the last injunction that a few remarks may be necessary. If it be certain that in the language of the people at large, the Saxon idiom is not only the predominating, but the most impressive element; and if there be, perhaps, no vice which so much prevents the preacher from producing an edifying effect as the habitual use of high wrought language and hard words, it follows that whenever the pulpit orator has a choice, he should make it a rule to select terms familiar instead of Græco-Latin derivatives.

Archbishop Whateley remarks that the words of the English language convey their meaning with different degrees of velocity, corresponding to their remoteness

from the Saxon. In Latin derivatives it becomes less bright, and in Greek it glimmers obscurely before the scholar, and is quite opaque to the unclassical.

That compositions chiefly formed from the vernacular vocabulary are not necessarily mean, has been already observed, and if an additional illustration be necessary, it may be found in the sermons of one of our most gifted writers, the Rev. Charles Kingsley,* of which an able reviewer speaks in the following terms:—

"This little volume is one of the most remarkable we have met with for a long time. Discarding utterly the tasteless conventional pulpit phraseology, which with us is only not universal, and has the unhappy effect of either obscuring thought, or concealing the want of it. With a deep sense of the reality and awful import of the things about which he has to speak, and not forgetting that if he would speak with effect he must use terms within the comprehension of the humble, but not over intelligent Hampshire rustics, which form the bulk of his audience, Mr. Kingsley has been able to express Christian thoughts which the highest will not find unworthy of notice in the simplest, homeliest language, which is so predominantly Saxon that in whole pages one could hardly find a few dozen words of Latin origin."†

Let it, however, not be inferred that the preacher is recommended to go out of his way in search of perhaps some semi-obsolete Anglo-Saxon terms, as substitutes

* *Village Sermons*, by the Rev. Charles Kingsley, Rector of Eversley, Hants. Parker, 1849.

† *North British Review*. Vol. 15.

for such words as have been long naturalized, and are perfectly intelligible; such an ostentatious purism would, besides defeating its object, be as objectionable as an affected display of classical derivatives. What is meant is, whenever current home grown words exactly represent the ideas to be conveyed, they should, in discourses from the pulpit, be selected in preference; for, as the Scriptures furnish the texts, the Anglo-Saxon idiom is best adapted to expound them.*

Famous Preachers.

Before inquiring into the reason why many clergymen who have carried off the highest honours at the universities, preach either to empty pews, or to listless congregations, while other ministers, much their inferiors in learning and taste, are sufficiently attractive to fill the largest building available; it may not be amiss to insert here a short sketch of a few of the most popular preachers of the past and the present.

The most brilliant preacher of the ancient Christian Church, was undoubtedly John of Antioch (born A.D. 347), surnamed Chrysostomos (the golden-mouthed). His pious mother devoted herself entirely to his early education. His rhetorical culture was the result of a

* Swift (*Letter to a Young Clergyman*) observes—"I believe the method observed by the famous Lord Falkland, in some of his writings, would not be an ill one for young divines. I was assured by an old person of quality, who knew him well, that when he doubted whether a word was perfectly intelligible or not, he used to consult one of his lady's chambermaids, and by her judgment was guided whether to receive or reject it."

diligent study of the ancients. An enemy against all wrong, with a heart filled with love flowing from faith, he became the idol of the people. Erasmus says of him, that he could, by his eloquence, impart sweetness to things naturally bitter, and make one love even his rebukes. His Homilies,* which, according to the present standard, can scarcely be called sermons, were eminently practical. Although he sometimes indulged in gorgeous imagery and illustrations, he more frequently denounced vice and commended virtue in simple language. In those days sermons were as now—though rarely—read off entirely from notes, sometimes committed to memory, and sometimes were altogether extempore. Chrysostom says, that his subject was frequently suggested to him while on his way to the church, or by something which occurred during service. Short-hand writers took down on the spot the discourses of famous speakers. Hence, there were frequently complaints that the sermons had been inaccurately taken down by the note-takers.

The ancient ministers had a powerful incentive to good preaching in the applause of the congregation. Clapping, shouting, waving of light garments at striking and impressive passages, were no unusual signs. When more than usually pleased, the people shouted, "Thirteenth Apostle! Christ has sent thee!"

"Vain ecclesiastics," remarks Neander,† "made it the chief or only aim of their discourses, but serious men

* See *Homilies of St. Chrysostom.* Oxford.

† *Der Heilige Johannes Crysostomus.* By Prof. Neander. *Neander's History of the Christian Religion.*

rebuked it. Chrysostom must have had more than enough of this applause, for on some occasions he told his audience that he should prefer their penitence to their plaudits. 'This is no theatre; you are not sitting here as spectators of comedians.'"

The most attractive British preacher, in the last century, was George Whitefield, (born 1714 died 1770), who appeared to have taken a leaf out of the book of Chrysostom; for his sermons consisted of little more than familiar and lively expositions of parables. The interest which he excited, was not limited to the common people, but extended, as we are told, to court beauties, and such latitudinarians in matters of religion as Chesterfield, Bolingbroke, and Hume. He must have been no mean orator of whom the great sceptic said, that it was worth while walking twenty miles to hear him; or who could conjure out at a charity sermon all the coin from so cool and calculating a personage as Benjamin Franklin. It is impossible to judge of Whitefield's oratorical talent by his published sermons, and Franklin is not far wrong in remarking that it would have been better for his reputation if he had left no written works behind, as his talents would then have been calculated by their effects.

Whether it be true or not that Whitefield had taken lessons of Garrick, there cannot be any doubt he owed the greater part of his popularity to his manner. Such vehement earnestness, combined with the most effective elocution, was new to his generation. His voice is asserted to have been, in the open air, audible at a distance of a mile, and at the same time capable of

expressing, by its variations, every possible emotion. One of Whitefield's biographers asserts that he sought out the most acceptable tones and gestures as well as acceptable words. Whitefield thus affords an additional illustration with regard to the importance of action and elocution even in sacred discourses.

Inferior in real eloquence, in learning, in genius, and in presence to Whitefield, but equal, if not superior to him in attractiveness, is the preacher of the day—Mr. Spurgeon. The prodigious success which has attended the ministrations of this gentleman is a riddle to many, which is certainly not explained by a perusal of his published sermons. The problem is, however, capable of solution.

Setting aside lofty eloquence and erudition, which are demonstrably proved *not* to be essential requisites for a *popular* preacher, Mr. Spurgeon possesses qualifications more than sufficient to account for the extraordinary effects produced. His voice in the first place is, though not orotund, with its attributes of richness and tenderness, powerful enough to fill the largest available building. His articulation is remarkably distinct; having but little learning, he is wholly free from pedantry, and conveys his similes and metaphors, in which he exults, in language so homely that it approaches, and often transgresses the verge of vulgarity. He appears, and no doubt is, thoroughly in earnest. He posesses a remarkable power of rousing the attention of his audience by startling disclosures, and by direct appeals to some of his hearers, who, according to a power of introvision, which he claims, are, through their sins, resting under condemnation.

It will thus be observed, that Mr. Spurgeon is not only a bold, but a *daring* preacher. The multitude who admire boldness even in a criminal, are absolutely over-awed by the *daring* of a clergyman. If to this be added, that Mr. Spurgeon is in possession of youth, in itself a "tower of strength," especially in a preacher, it will be found that the extraordinary results obtained are by no means incommensurate with the means applied.

This is not the place to discuss the question whether these means to attract the crowd to places of worship are legitimate or not; certain it is they are effective. All that can be said in extenuation is:

> "Who on efficient working is intent,
> Must choose the most efficient instrument."*

Nor is there much fear that Mr. Spurgeon will lose his hold on the people. As long as the masses will remain what they *are*, so long will such preaching collect crowds of listeners.

> "With absent minds, as to a masque they press,
> By curiosity alone are drawn here;
> Ladies display their persons and their dress,
> And without pay in character appear."†

"*Preachers and Preaching.*"

There being nothing new under the sun, the letters of "Habitans in Sicco," in the *Times*, on "Preachers

* Göthe's *Faust*. Translated by Ann Swanswick. † Ibid.

and Preaching," merely raked up old sores; as the reader may find on perusing the pages of the *Spectator*, which 150 years ago, was, at that time, as the *Times* is now, the Redresser General of Grievances. A quondam "Habitans in Sicco" writes as follows:—

"Our preachers stand stock-still in the pulpit, and will not so much as move a finger to set off the best sermons. We meet with the same speaking statues at our bars, and in all public places of debate." He moreover laments that they do not keep their audiences awake, nor show that they are in earnest with what they recommend to others. Dr. Byrom says:—

> "For what's a sermon, good or bad,
> If a man reads it like a lad?
> * * * *
> Our learned bishops, one would think,
> Had taken schoolboys from the rod,
> To make ambassadors of God."

Dean Swift, in his *Letter to a Young Clergyman*, says:—"I hope you will think it prudent to pass quarantine among the desolate churches five miles around this town, where you may at least learn to *read* and *speak*, before you expose your parts in a city congregation. Not that these are the best judges, but because, if a man must needs expose his folly, it is more safe and discreet to do so before few witnesses."

This prudent advice may, as far as the metropolis is concerned, be followed with great advantage by reversing the locality, and by the young clergyman passing quarantine in the deserted city churches, ere venturing to appear before a suburban congregation.

However excellent an adviser, Swift cannot have been a very vivacious orator, for among the comparatively few of his sermons which have been published, there is one "On Sleeping in Church," to which his congregation, as it appears, were much inclined. The text was as follows:—

"And there sat in the window a certain young man, named Eutychus, being fallen into a deep sleep; and while Paul was long preaching, he sunk down with sleep, and fell down from the third loft, and was taken up dead."—Acts xx. 9.

The exordium runs thus:—

"I have chosen these words with design, if possible, to disturb some part in this audience of half-an-hour's sleep, for the convenience and exercise whereof, this place, at this season of the day, is very much celebrated."

The dean does not, however, attribute the somnolency of his congregation to the soporific effect of his delivery, but says in his peroration:—

"This indecent sloth is very much owing to that luxury and excess men usually practise upon this day; men dividing their time between God and their bellies; when, after a gluttonous meal, their senses dozed and stupefied, they return to God's house to sleep out the afternoon. Surely, brethren, these things ought not to be."

The Art of Speaking.

The inaugural address delivered by Lord Stanhope to the students of Aberdeen, in which that accomplished

nobleman skilfully applied the saying of Horace, that "Life has given nothing to man without great labour," to the acquisition of the art of speaking, has called forth an able article in the *Quarterly Review*, and a most powerful leader in the *Times* of April 1, from which the following passages are extracted:—

"It is a plain fact, which cannot be disputed, that neither at our universities, nor at our public schools, nor in any other places and systems of education in vogue amongst us, is any attempt made to teach the art of speaking. What may be adduced in the way of exception is utterly inconsiderable. * * * * What is the common gift of all classes, all professions, all ages from infancy—what is the first and foremost difference between man and brute, and between one man and another—is left to *chance*, without any assistance whatever from our schools and universities. * * * * Hundreds of excellent gentlemen aspire to parliament, and get in or not, with the same ultimate ill success. The moment they try to speak, all their feelings, thoughts, facts, and purposes, crowd to the tongue, or fly together, and leave it utterly bankrupt of words."

Some years since the author ventured in (*longo intervallo*) feebler language, to express very similar sentiments in his *Treatise on the Cure of Stammering*. In the third edition, published in 1857, the following passage occurs, page 40:—

"It is a remarkable fact that, at the present time, little attention is thought worthy to be paid to the art of public speaking. The culture of elocution is nearly

neglected at our universities, and the management of the organs of speech is not taught at any college or school—all is left to *chance;* yet this country holds out the greatest inducement to persons to become orators, seeing that eloquence often does more to raise an individual in the world than any other mental qualification. We lose the influence of great numbers of members of parliament, because they are hardly able to express their ideas on the subject before them, independently of their numerous defects of articulation."

Concluding Observations.

The most serious defect in the systems of education, pursued in our schools and colleges, in relation to the art of speaking, is probably the unpardonable neglect of the department of language, particularly of our own tongue.

The cause of this apathy in the public mind with regard to the subject of language, seems to be that in this age of steam and electricity, the natural sciences are, from their visible influence upon all practical pursuits, considered as possessing paramount claims. Fully granting the importance of scientific instruction, it by no means follows that the study of language, and particularly of our own tongue, should be neglected; for so it is. As the pupils are not properly trained to precision in the use of words, they fall into habits of using vague words, of the meaning of which they possess no clear perception. The teachers themselves are mostly

incapable of explaining the obscure expressions, for in almost all schools the English department is considered the most subordinate one, and of course the salary attached to it is in proportion to the estimation in which it is held. "What is called," says Dr. Whateley, in most seminaries, "the English master," is usually a person of very humble qualifications, who for the most part contents himself with making his pupils mind their stops."

This ought not to be. As the formation of ideas keeps pace with the progress in language, which thus forms the basis of intellectual development, it follows that the English department is really the most important branch in early education, and requires the services of a person of superior attainment, as it will generally be found that the character of the school and the progress of the pupils depends mainly upon the mental and moral qualifications of the English teacher.

If the English language is in our schools to be taught at all, it should be taught well, not exactly for the purpose of forming orators, but to enable the child to read intelligently and agreeably, and to express himself for the rest of his days in writing and in his speech correctly and fluently. This is an indispensible study for *every* condition in life, and should be cultivated as soon as the child is able to express its wants in words. But to whose care are we committed in the earliest period of our life, and to whom are we indebted for the first rudiments of our knowledge?—to *woman;* and it is upon *her* intellectual and moral development that the welfare of future generations greatly depends. The

foundation of the art of speaking, as of everything really valuable in life, must then be laid in that important seminary, *the nursery*, the governess of which, if the mother cannot undertake the task, should not be a German or French *bonne*, or a girl just come "bran new" from a "finishing school;" but an experienced and highly educated woman, who is perfectly at home in the ENGLISH DEPARTMENT.

THE END.

ERRATA.

Page 29	line	10	*for*	nervous	*read*	venous
„ 266	„	25	„	Greek o	„	ϕ
„ 270	„	20	„	require	„	acquire
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Stephen's Ecclesiastical Biography . 22
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Sydney Smith's Memoirs . . . 21
Symonds's (Admiral) Memoirs . . 22
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" Wesley 22
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" Lectures on French History . 22
Sydney Smith's Works 21
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Taylor's Loyola 22
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" Poems 14
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" Selections (illustrated) . . 26
" Lalla Rookh 17
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" National Melodies . . . 17
" Sacred Songs (*with Music*) . 17
" Songs and Ballads . . . 16
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